

JOURNAL
OF THE
ASIATIC SOCIETY.

MAY, 1848.

The Turae and Outer Mountains of Kumaon.
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The following details, chiefly botanical, comprize the result of observations made during several short excursions from Almorah to the Turae and Outer Mountains of Kumaon, between the Kosilla and the Kalee rivers. Performed during the cold season or spring, many deficiencies must necessarily exist, especially as to the vegetation of the Turae and the mountain range immediately above it, which is most copious and luxuriant during and immediately after the rainy season. A few days' sunshine then suffice to wither and efface all traces of many herbaceous plants. The climate, however, is unfortunately so unhealthy at that season, as to preclude any thing beyond the most rapid transit, and even this small advantage the writer has not enjoyed. Still, he believes the subject may be interesting; the routes including part of a tract intervening between those exhausted by Drs. Wallich and Royle, and never visited by either of these gentlemen.

December 6, 1846.—From Almorah to Munjerd, at the Khyrna Bridge, distant 18 miles. At 5 or 6 miles, below Chousulla village, by a pretty iron suspension bridge, cross the Suwal river, a little above its junction with the Kosilla, which it nearly equals in size. Above this point the Kosilla flows through a very deep and impracticable gorge, formed on both sides of granite, which, at Chousulla, gives place to gneiss and slate rocks. On the right or west bank, the granite reaches

to within a few hundred feet of the summit of Seeahee Devee, 7200 feet: on the Almorah bank, its elevation does not exceed 5500 feet.

At 10 miles, the road, now keeping the left bank of the Kosilla, passes Muners or Munrus, a village partly on, partly at the base of a hill, in form resembling Tom na heurich at Inverness; it is about 600 feet above the river, and 3847 above Calcutta; there is a considerable plateau of cultivation to the south, the revenue of which belongs to Budreenath, across the Kosilla; Seeahee Devee, covered with pine, rises boldly, "by the first intention," 400 feet; far in front, on the same side, in the Phuldakot Pergunna, is seen a conspicuous tree on the Sher ka Danda summit, about 6000 feet high; under this tree is a murhee of Symdeo, the haunt of a *Gwntk* or diviner by means of rice tossed on the palm of the hand:—the rogue has selected a site visible to a great distance in every direction. About a mile short of Munrus, the road crosses a small stream from the south by a natural rock-arch, known as Beemota and Bheem ka Sanga.

From Almorah to Munrus, the scenery is bare and monotonous, but now becomes wild and beautiful, with considerable resemblance to the Swiss Val de Montiers. The river, clear as crystal, dashes on amidst huge quartz rocks, or reposes in deep blue and green pools, abounding in otters "od," and largh fish. The banks rise steeply, covered with a sub-tropical vegetation, which may have crept in here, with the tigers and hot winds, behind the alpine and oak-crowned barrier of the Gagur. Up the long and tortuous course of the river from Chilkiya, about 3 miles short of the Khyrna, the road crosses to the right bank of the river by a new and very elegant iron-suspension bridge on Dredge's principle: the space is 60 paces. Jiaree village, from which it is named, stands several hundred feet above, and the road, forced up by precipitous rocks, to the dismay of the wearied traveller, ascends nearly to the same level, only to fall again, and two miles on, re-cross the river by the Tipulee Dhoonga Bridge, resembling that at Jiaree, but only 51 paces over. The original road followed the left bank continuously, avoiding the necessity for these very creditable but expensive constructions: it has unfortunately become almost impassable, and in the rains extremely dangerous from several incurable landslips of quartz-debris from the northern steeps of the Lohakotee range. There are those to whom these bridges suggest the idea of the Manzanares, which should have

had a smaller bridge or a larger river ; for above half the year, owing to the heat of the valley, the route is forsaken by Europeans ; but is the main line of intercourse by means of the native traders between Almorah and Chilkiya, and that too in quite sufficient numbers to justify the outlay. Be that as it may, their picturesque effect on the scenery is undeniable ; while such works diffuse over the native mind, a most potent impression of European superiority. The first sight of the Buliya bridge near Bumouree, shaky enough, and much less handsome than those of Jiaree, excited shouts of admiration from a company of Golundaz, who witnessed with perfect indifference the view of the Snowy range from the Gagur Pass ; Nurayun was beaten on his own ground by the Company Buhadoor.

Beyond the Tipulee Dhoonga Bridge, there is a mile of steep narrow road, carried along a chloritic precipice beetling over the Kosilla ; this rock is exceedingly tough and occasioned much trouble. We now reach the Khyrna river flowing north from the Nynée Tal ranges and Eastern Gagur, in a wide stony channel, not a tithe of which is now occupied by its brisk clear current—the cold flowing waters that come from a far country—but which in the rains form a tremendous torrent, requiring a third suspension Bridge, 48 paces over, and generally known as the Munjera Bridge, from a neighbouring village, on the grounds of which we encamped : an exceedingly cold spot in winter from the shade of the adjacent mountains ; elevation 3000 feet, and severe hoar frost at night.

The left bank of the Khyrna consists here of iron-stone (red hæmatite) cliffs, which have been deeply mined in former days, but appear to be unwrought at present. A blue crystalline limestone occurs on the descent to the Jiaree Bridge, appearing also on the opposite side of the same mountain between Ramgurh and Peorah. Between the Jiaree and Tipulee Dhoonga bridges, dykes of syenitic granite and greenstone pierce and harden the quartzose strata along the right bank of the Kosilla, and appear to have tilted them into a vertical position ; this forms the nearest eruption of a granitic rock which we observed towards Nynée Tal.

Below the Jiaree defiles, the Kosilla meanders through a rather wide, cultivated valley, and finally escapes from the mountains by the Dhikolee Pass above Chilkiya. In the warm season this valley is uninhabitable, and in the wet season the river, which must be repeatedly passed, is unfordable : but during the cold weather, when the Gagur Passes are

shut by snow, it affords an easy, though circuitous route from Almorah to Chilkiya.

The vegetation from Jiaree towards Almorah consists of—

Rosa Brunonii : "Kooja."	} lowest limit, 2500 feet : with <i>Cratsegu</i> <i>crenulata</i> : Surjoo Glen.
Cerasus Puddum : "Pudm," "Puya."	
Pyrus variolosa : "Mehul."	

Hedera helix and *H. parasitica*.

Vitis lanata and *V. latifolia*.

Pittosporum eriocarpum :—"Gur-silung," "Gur-shoona."

Clematis Gauriana, *C. Buchananiana*, and *C. grata*.

Thalictrum foliolosum : "Pengla-juree," "Chulnia :"—lowest limit 3000 feet.

Crotolaria sericea : *C. tetragona*, *C. alata*, *C. albida*, and *C. prostrata* : "Goongree."

Bauhinia retusa : "Kandla," "Kanulla."

Bauhinia variegata : "Khweiral." From 2000 to 6000 feet.

Bauhinia Vahlia : "Maloo:" "Maljhun : " the fibre of the bark affords a very strong and durable rope : hence the name from "mul," to hold : or because the leaves are in general used to contain ghee, &c.

Erythrina stricta : "Roongura."

Edwardsia mollis.

Dalbergia robusta, and *D. Ougeinensis*. The timber of the last, "Sannun," is very durable, and much used for ploughs, furniture, &c.

Oxyramphis.

Desmodium ? a shrub with hoary leaves and yellow flowers.

Acacia sirsia ? "Kulsees." The bark is applied for hurts to the eye.

Acacia mollis : "Burou ;" and *A. pennata* ?

Mimosa rubricaulis : "Agl."

Pueraria tuberosa. This fine climber is in profusion along the exterior belt of the Kumaon mountains, and is known by the names "Bilae-kund," "Billee," "Biralee-pona." Children are employed in digging up its enormous tubers, which are exported to the plains, being considered to possess very cooling properties. It seems to be Dr. Royle's No. 71, in the List of *Materia Medica*, J. A. S. for October, 1832, and if so is identical also with his No. 78, "Sural," and "Sural," being the names of *Pueraria* in Sirmour.

Jasminum pubescens, and *J. grandiflorum*.

- Nyctanthes arbor-tristis* : " Kooree," " Parijat."
Glycosmis pentaphylla : " Potula."
Murraya exotica : " Jootee." From 2000 to 4500 feet.
Bergera Königii : " Gunee."
Sterculia (Wallichii ?) : " Bodula."
Hibiscus Lampas : " Kupusya."
Grewia oppositifolia : " Bhengool."
Bombax malabaricum : " Semul."
Poirvrea Roxburghii.
Terminalia Bellerica : " Byhurah."
Terminalia Chebula, " Hur:" " Hurura : " the fruit pulled while young is sold as " Jungee Hurura," and " Bedmata"—mother of doctors.
Pentaptera tomentosa : " Saj."
Andrachne trifoliata : " Korsa."
Euphorbia pentagona : " Seehoond."
Phyllanthus Leucopyrus?* " Ainta : " and *P. Emblica*† " Amla."
Briedelia montana : " Kurgnulia."
Adelia : a beautiful shady tree resembling *Eugenia*, " Kandagar."
Ricinus communis. " Eend."

Rottlera tinctoria. " Roonee" " Rolee." Meets *Andromeda ovalifolia* at 4000 feet. *Rottlera* is the tree called " Kamilla in the Simlah mountains ; and it is curious enough that Dr. Royle (as quoted above—No. 408,) gives Kunbeel, Kumbela as the *Arabic* terms for " the strigose pubescence of the fruit."

Captain Thomas (*Views of Simlah*, p. 4,) states that the seed of the " Kamilla" is a sure cure for the distemper in dogs, if given immediately on the appearance of the disease : no *quantity* is mentioned, a very necessary element in an *Euphorbiaceous* recipe.

Captain Thomas, however, is mistaken in affirming that heaths " in great variety and beauty, alike of form and colour" exist in the mountains : not one species that I am aware of has yet been discovered. Nor is it much more probable that " the elder is found in abundance all round Simlah." *Sambucus adnata*, indeed, grows on Gossainsthan in Nepal, and on the mountains of Kashmeer, (Royle, *Hlus.* 236,) but " Elder (*Sambucus*, not the *Alnus* or *Alder*) Bhekla" (Thomas, p. 9.) if the vernacular name be correct, denotes *Prinsepia utilis*, which yields oil, but not wine : its berries also ripen in spring. Captain Thomas'

* *Fluggea Leucopyrus* ?

† *Emblica officinalis*.

"Elder" is probably *Viburnum* or *Rhus*: and, though a true holly be abundant, his "Mohroo" and "Kurshoo" are oaks.

Myrsine bifaria.

Saxifraga ciliata: "Silphora." (*The Stone-breaker.*)

Cascaria Cheela: "Cheela," "Cheelara."

Marlea begonifolia.

Cornus macrophylla: "Kagsha."

Geranium bicolor and *G. Nepalense*.

Oxalis corniculata: "Chulmoree."

Rumex hastatus: "Chulmora," Sorrel.

Rumex Nepalensis. Dock.

Bupleurum tenue.

Bidens Wallichiana: "Kutaree."

Onoseris lanuginosa: "Kupasee;" to Jiaree.

Leucomeris spectabilis: "Punwa."

Ammannia rotundifolia: "Durmeea."

Leucostemma angustifolium.

Leucostemma latifolium, at 6500—7000 feet on Budhan Benaik.

Lindenbergia ruderalis, and *L. grandiflora*.

Solanum indicum: "Kutung-karee."

Verbascum thapsus: "Ekulbeer."

Callicarpa incana: "Duya."

Gmelina arborea: "Kumbhar."

Holarrhena antidysenterica: "Kooer."

Holarrhena pubescens.

Wrightia mollissima: "Durhela"—"Dyhra."

Cryptolepis reticulata.

Vallis dichotoma.

Ichnocarpus frutescens.

Carrissa Carandas. "Timookhia."

Barleria cristata.

Adhatoda Vasica: "Bashing."

Colebrookia oppositifolia: "Doolshut."

Pogostemon plectranthoides: "Roodra."

Scutellaria repens.

Hamiltonia azurea.

Ixora tomentosa.

} "Doodhee."

Ficus Cunia : "Kewnia."

Ficus macrophylla : "Timala."

Ficus : "Gur-timala."

Ficus : "Kewnia,"—"Kismira."

Sponia : "Khusuroa."

Rhus Kakrasinghi : "Kakur." 2000 to 5000 feet.

Rhus parviflora : "Runnel," "Rai-toong."

Rhus velutina : "Toong," "Amee," (from its mango fragrance.)

Mangifera Indica.

Odina Wodier : "Jinghun."

Elaeodendron dichotomum : "Shouria."

Celastrus spinosus : "Gwala-darim."

Celastrus nutans : "Malkagnee." The oil expressed from its seeds is highly valued in rheumatism.

Rhamnus virgatus : "Chudooa."

Sageretia oppositifolia : "Uglai." 2000 to 5000 feet.

Gouania leptostachya ? { "Kangnee ka bel." "Soobela:" a very
common climber of the outer mountains
from the Kalee to the Sutluj.

Hiptage Madablota, (i. e. *Madhavi-luta*.) "Aita-lugoola."

Porana racemosa, and *P. paniculata*.

Ipomoea cerulea, and *I. muricata*.

Deeringia celosioides : "Kalee-loaree" "Kulia-thoka."

Ærua lanata.

Trichosanthes palmata : "Indrayun."

Kalanchoe varians : "Noonoo."

Asparagus adscendens : "Khyrooa."

Fritillaria Thomsoniana : to Munurs.

Cissampelos convolvulacea : "Paree."

Cocculus cordifolius : "Goorcha."

Berberis Asiatica : "Kilmora." This bush descends to the upper limit of *Nauclea cordifolia*, *Moringa*, and *Acacia Catechu*—about 2500 feet. There can be little doubt it is the species described by Don and Roxburgh, but with pendulous racemes; and apparently identical with that which Dr. Royle calls *Berberis Lycium*, under the impression that it had been erroneously included in *B. aristata*. Dr. Royle inclines to identify his *B. Lycium* with *B. angustifolium*, Roxburgh; but Don

more correctly in my opinion, considers the last to be *B. aristata*—the “Chotra” of Kumaon. Both species are extremely common all over the Province, from which it would appear that Roxburgh obtained his specimens. In the List of *Materia Medica* before alluded to Dr. Royle also mentions *B. asiatica* (No. 240,) as growing in the Hills. The etymology and the consent of the Pundits of Kumaon proves that this, and not *Curcuma xanthorhiza*, is the Sanscrit “Daroo-huridra,” the Persian “Dar-huld” “Yellow wood,” of which *Ruot* (S. Rusangjun) is the extract. Kushmul is from Kushayu, *extract*, and mull, *having*.

Nasturtium officinale: “Peeria.” Abundant at Jiaree and Seetabun, as it is also in the streams at Pinjore, where it might be turned to some account for the troops at Kusowlee, &c. One is surprised to meet this, and other north of Europe plants, as *Ranunculus sceleratus*, *Veronica Anagallis*, &c. only at very inferior elevations in the mountains: they disappear between 4000 and 5000 feet: a circumstance which may be accounted for by the diminished pressure of the atmosphere, as hinted by Humboldt.

Adiantum capillus veneris and *A. rhizophorum*.

Eriophorum comosum: “Babur.”

December 8. To Nynee Tal, 12 or 14 miles, involving an ascent of 4475 feet, of which a considerable portion is steep and continuous to the Ulmah ka khan Pass, 7431 feet above Calcutta, according to the Trigonometrical Surveyors, but 200 feet less by the observations of Lieut. R. Strachey of the Engineers, whose determination of heights in this quarter will be marked by his initials.

Quitting the Kosilla at Munjera, and ascending for about two miles, the road diverges, one branch to the S. W. leading by the Gagur Fort on the Budhan Binaik, towards Chilkiya Munde: this pass is about 7200 feet above the Sea, the encampment between Munjera and Kotah being at Mehula, an inconvenient spot a few hundred feet below the crest, southward; the other branch proceeds due south to Nynee Tal. A more interesting, though somewhat difficult route follows the bed of the Khyrna, disclosing scenery wild and beautiful, with much of the character of the Sewalik Passes. At about three miles from the Khyrna Bridge, the Ramgar (Khyrna) stream is left to the east, and a mile farther, the Ninglath or Shamkhet stream, in the same direction, the course of which is completely misrepresented in the Trigonometrical

Map. As much further on, where the river route meets the made road at an elevation of 3896 feet, (R. S.) the torrent again forks, the eastern branch rising in the Lurria Kanta Peak, and leading to Ulmah ka Khan; that to the west has its sources in Cheenur mountain, and near Jak and Boodlakot villages, forms several fine cascades just visible from the road; the greatest of them has a fall of 270 feet.

In the bed of the Khyrna, below this point, the *Datisca cannabina* (or *nepalensis*) grows luxuriantly: its bitter yellow roots are in some medicinal estimation under the names Bujr-bhunga and Bhung-jala (water-hemp). *Dalbergia robusta*, "Buro," is large and abundant hereabouts; and between 6000—6500 feet occurs an undescribed *Ipomœa*, with small pink blossoms, which Mr. Edgeworth proposes to call *I. oxyphylla*. It is also found, I think, below Khathee, on the Pindur.

During the latter portion of the ascent to the Ulmah ka Khan (Ulra ka Khan in the Map) the mountain scenery becomes exceedingly grand and varied: to the right, and ahead, the vast summit and inaccessible steeps of Cheenur are feathered with cyprus and oak; to the left are Lurria Kanta and its spurs; to the north, at a profound depth, is the bed of the torrent, blocked up with great boulders—and over and beyond it the long line of the snowy range. The forest on the road side consists for the most part of *Pinus longifolia* and *Quercus incana*, both of large dimensions. The Pass is named from a Rohilla invader who was slain here, or from a Devtah of the same name; both accounts are in vogue. From the crest, there is an abrupt descent of about 1100 feet to Nynee Tal, the upper end of which bears nearly south, distant one mile, in a horizontal line.

This now celebrated, but somewhat over-puffed lake, is a small tarn, extending from N. W. to S. E. about seven furlongs, with a maximum breadth of $2\frac{1}{2}$: the greatest depth about 80 feet. It is fed by a small rivulet from Cheenur; and at the opposite or S. E. extremity, issues one of the sources of the Buliya river, which, flowing down a gentle and lovely valley of quite Italian scenery, joins the Goula above Bummouree. Through this glen a carriage road is perfectly feasible to within a couple of miles of the station, and its commencement has been authorized by the Honorable the Lieutenant-Governor, N. W. P.

The water of the lake is perfectly clear, and under the generality of the skyey influences, exhibits a blue which reminds one of a reach of

the upper Rhine, or Switzerland's smallest lake, Zug, which however, is much larger than Nynee Tal. Near the brink, the surface is matted with a tangled mass of *Potamogeton mucronatum*, *Myriophyllum indicum*, *Chara verticillata*, *Polygonum scabrinervium*, and the pretty English *Polygonum amphibium*, which here, and here only in India, so far as my experience goes, raises its pink spikes above the water. Where free from these, the surface reflects its splendid framework of mountain and wood like a mirror. Though only so recently known to European civilization, it is said to be described in the Skund Pooran under the appellation Trikhi or Tririkhi, "The Three Saints"—to whom must now be added a fourth, a Jewish Saint, "St. John in the wilderness," in whose name a very pretty Gothic church has been erected on one of the most picturesque sites in the settlement. A new temple of Devee adorns the exit of the lake, but St. John has put the "Three Saints" to flight, and the mountaineers generally consider the waters as polluted and desecrated by the beef of the butchers, and the skins of the *bihishteas*, who follow in the train of his votaries. The consequence is a sensible decline, and probable fall of the spring-fair held annually in honor of Devee, the lady of this Indian lake. The modern designation reminds us of the still more celebrated Nynee Devee, the patroness of the Sikhs, overlooking from her mountain shrine the Sodee town of Anundpoor Makhawal, where the Sutluj leaves the Himalaya; we have Beebee Nanee in the Bolan Pass; and James Prinsep would have evoked many a Nanaia and Anaitis from his coins and historians. Allowing a Persian origin to this form of the goddess, we perhaps have the etymology in *nan*, bread; in this instance, unhappily an exemplification of *lucus à non lucendo*, the bread of Nynee Tal being the worst in the world.

The lake is separated from the Plains to the S. W. by the rugged mountain of Uyarpata, so named from the predominance of the *Andromeda* in its woods, which also abound in admirable specimens of the green oak, *Quercus dilatata*. This mountain, as well as the low neck of Hancee Bancee (*Echo*) which joins it to the lofty and precipitous peaks of Deoputa to the N. W., is almost exclusively formed of the transition limestone of Musooree, exhibiting everywhere vast rents, caverns, crags, and blocks, and falling so abruptly to the water, that till 1847 nothing beyond an indifferent path-way was attempted "the villainous saltpetre" is now at work on the rocks, and a wide road at the level of the

lake underlies half the mountain, which, when completed, will form a "Chukkur" of three to four miles, unrivalled in India. It must be acknowledged, nevertheless, that the sense of constraint and confinement is unpleasant and inevitable; no view of the snows, or even of the surrounding sea of mountains is procurable at a less expenditure than a clamber of a thousand feet, except to the residents of the ridges, who acquire the privilege at the price of a daily descent to the lake, unless they choose to imitate the Hindoo ascetics and perform a solitary penance on their "aery citadels." In this respect, Nynee Tal is inferior to the other Hill stations; its advantages consist in the exercise of boating, and, to those who have sufficient health and energy, in excursions to the many glens around, which to the sportsman, the draughtsman, and the naturalist, possess a richness of attraction undreamt of at Simlah. There is indeed one extensive tract less open to the above objection, the Ghiwalee Estate, the property of Captain Arnaud, lying to the south of Uyarpata, and comprising a series of swelling and beautifully wooded elevated lawns, which, to the south and S. W. terminate abruptly in a facade of magnificent precipices, from 1500 to 2000 feet high, from the bases of which issues the Nehal river, flowing to Kaleedhoongee and the Bhabur, a vast expanse of which, and of the Plains beyond, lies stretched below like a carpet. To the east, these cliffs are of clayslate, in the centre of limestone; to the N. W. of slate again, distinctly stratified, and dipping from the plains. Here, as in the glen of the Buliya, the rocks appear to rest on beds of blue alum shale and white gypsum, which must be of immense thickness, as they accompany us nearly to the foot of the mountains, when the gypsum assumes the texture of alabaster. There is a strong chalybeate spring in the glen of the Buliya. We find this same gypsum in exactly analogous circumstances, (i. e. just outside the limestone,) at Suhusradhara in the Dehra Dhoon, and at Subathoo, under the limestone of Kuroi; and this limestone, which in the Lohakotee mountain becomes crystalline in contact with the micaceous rocks, exhibits precisely the same change at Jutog near Simlah: a proof that the geological phenomena of the Himalaya, though "a mighty maze," are "not without a plan." To the very brink of the Ghiwalee precipices, the woods are composed of oak, ash, maple, Siberian crab, cypress, and other northern forms, while the sward abounds, in the *Primula denticulata*, *Parnassia nubicola*, &c.: with *Paeony* at no

great distance. Immediately beneath is the semi-tropical vegetation of northern India. The cliffs are slowly wearing back, and many of these oaks, &c., must be carried down by the torrents to mingle with the *Naucleas*, *Oodinas*, &c. below. Now let us only suppose that a deposit of coal was formed : what a trap to catch geologists, who would from its contents draw the fullest conclusions as to the anomalous climate which in former ages had permitted such incongruous materials to co-exist!

The limestone pinnacles of Deoputa are about 7800 feet high ; the rock is here greatly shattered, and a complete wilderness of blocks lie strewn below in the valley leading to Kaleedhoongee, resembling another Glengariff, and equally softened by a mantle of coppice. Deoputa declines N. E. to a gap, known as the Cheenur or Deoputa ka Khan, 7438 feet high (R. S.) and opening two routes by the savage glen of the Bukra (or Boula) river to Kotah. Beyond this, the ridge is continued in the same direction, till it merges into Cheenur, the broad-browed monarch of the Gagur, 8526 feet above the Sea, (R. S.) and 2,200 above the lake, from which it stands about a mile and a quarter horizontal distance, and to which it presents a rocky and shingly front so precipitous as to be inaccessible. The basis of the mountain is clay-slate, apparently dipping West or N. W. yielding excellent materials for roofing, like that of Ghiwalee : but the summit is capped with limestone, which also occurs on the acclivities facing the S. W.

On reaching the crest, as seen from the lake, it is found to run back towards the N. W. for perhaps 1200 yards as a level ridge, exactly in the line and direction of the lake's length. The summit is clothed with a brushwood of *Indigofera*, *Spiræa*, *Elsholzia*, *Salix* ; *Androsace lanuginosa* covers the rocks ; *Anemone discolor* occurs in the shaded places ; and at the cairn of the Surveyors, grow a new *Stellaria* (*semivestita*, Edgw.) and the *Hemiphragma heterophyllum*. The Holly (*Ilex dipyrrena*) reaches a great size : one measured near the ground was between 16 and 17 feet in girth : but the characteristic tree of Cheenur is the *Quercus semecarpifolia*, which fringes the crest, and covers the whole S. W. face ; *Budhan Dhoora* and *Sat-choolium*, points of nearly the same altitude, and at no great distance, on each side of Cheenur, have not a trace of it ; and on the former I could only find a few specimens of *Colquhounia vestita*, a very common shrub at Nynce Tal and towards Budreenath. The *Limonia laureola*, too, occurs only in this locality on

the Gagur range, so far as my researches extend ; and though the Cypress is said to exist in Dhyanee Rao, it appears to be in small quantity, limited to a grove or two ; the face of Cheenur towards the lake, on the contrary, bristles with groves and clumps of this dark and stately tree, which recurs, though in diminished numbers, on the Ghiwalee cliffs, as low down as 5100 feet. The vegetation of Cheenur and Nynee Tal thus presents some difficult problems, which the natives resolve at once by the assertion that the Oak, Cypress, Limonia, Colquhounia, &c., were imported from the snowy range and planted here by Deves herself : and one might really suspect that some of the fanatics who did penance on Cheenur in days of yore, actually introduced them from the holy *teerths* among the snows, were it at all probable that they would have condescended to such humble plants as the Hemiphragma and Anemone. Moreover, on this principle it might be surmised that Pilgrim put the Polygonum amphibium into the lake to make it more English !

The view from Cheenur embraces Rohilkhund, Kumaon, Gurhwal and the Snowy range, from the sources of the Jumna to those of the Kalee. The great Himachul must be about 65 miles distant in a straight line, and its details are therefore less distinct than from Binsur and Almorah, whence the superior limit of forest is perfectly defined—much more so than the snow line—and above which the eye reposes with a never to be satiated curiosity on the enormous shelving masses of rock and snow which appear as if they would squeeze Mother Earth to a mummy. Here we have the Gungootree group running apparently north, with sloping, and apparently stratified planes to the east ; then comes the great Kedarnath mass, said to be the original Soomeroo, whence Siva regards with jealous rivalry his neighbour Vishnoo, who dwells over the way in the still grander mass of Budreenath, or rather on the Nurayun Purbut, the snowy cone above Budreenath Temple, which is perhaps the Naubandhana Peak, to which he is fabled to have moored the ark after the deluge. The base of the great square mass alluded to, was visited in 1847 by Major Sampson, who ascertained that the Vishnoogunga rises there to the west of Mana, from three separate glaciers, the Sutputee to the S. W. ; the Pabeegurh, West ; and the Soopow, or principal glacier, to the N. W. The last comes down from a range called Punkwadanree, constituted, as shown by the boulder-debris, of normal grey granite, the existence of which in the great crest

had never before, I think, been observed. Much further to the S. E., with Binsur for our station, a good glass enables one to detect abreast of Moongsharee, amongst the western recesses of the Punch Choolla Group (the fabled abode of the Five Pandoos,) what will probably turn out to be one of the greatest glaciers of the Himalaya, well deserving the examination of any future traveller on the Milum route. (It is in good hands.)

Cheenur mountain is prolonged S. E. in the Boorans ka danda, "Rhododendron Range," a razor-edged spur, so narrow for several hundred yards as to try the nerves of the new-comer severely. The Ulmah ka Khan Pass divides it from the Sher ka Danda, "Tiger Range," a name which from sure indications, I should say was equally applicable to all; centuries must elapse before it becomes as insignificant as our own Wolverhamptons, Bearhamptons, &c. The Sher ka Danda forms the east and north-east boundary of the lake, to which it falls in the easiest and most regular slopes of the station; but on its east and S. E. aspects, the slate which composes it crops out in tremendous shelves and precipices, with landslips which have thrown serious difficulties in the construction of the Post road to Almorah, viâ Ramgar, which passes this way. A syce who was unlucky enough to fall over about two years ago had an escape as miraculous as that of the burgo-master of Bern, or the Mameluke of Cairo.

The culminating point of the Sher ka Danda throws off a ridge to the N. E. which in a mile or two ends in the Lurria or Lurooa Kanta, an enormous mountain, rivalling Cheenur in mass, and attaining the elevation of 8023 feet (R. S.); its summit is quartz, bold and craggy to the north. On this mountain and the Sher ka Danda, alone, is to be found in this quarter, the *Quercus lanuginosa*: "Reeanj."

Having now completed the circuit of the lake-mountains, it only remains to search whether any trace remains of the agency which upheaved them. To Mr. Batten is due the discovery of the only two dykes of greenstone which have hitherto been detected—but doubtless a more careful and extended examination will bring others to light. One of those already known commences near the north end of the Lake, and may be traced N. E. to the summit of the Sher ka Danda; the second is on the opposite side of the lake, between Uyarpata and Ghiwalee, passing through limestone and beds of hornstone. The trappean rocks are said to re-appear between Koorpaka and Kalaputhur, when they

derange and alter the other rocks as usual. I have in my possession a trilobite imbedded in limestone, discovered by my friend Major Sampson in the rubble platform on which Sirmouria, "the Swing village," is built, between the 4th and 5th milestones, on the descent to Kaleedhoongee—the first, and as yet the last fossil afforded by Kumaon; (Vide Plate—where it is drawn by Lt. R. S. of the natural size.)

Houses have rapidly sprung up over most part of the settlement; some towards the crest of the limitary ranges are nearly 7500 feet above the sea: even the rugged and woody Uyarpata is being gradually planted; but the favorite sites are on the undulating tract of forest land which stretches back from the head of the lake to the base of Cheenur and Deoputa; in the S. W. angle of this area, about 260 feet above Nynee Tal, is the Sookha Tal, dry except during the rains; between this and some fine limestone crags to the south, lies the road to Kaleedhoongee, which, after an easy rise, at one mile from the Bazar, quits the valley and descends rapidly to the plains, from the "Abelia" Pass, 6800 feet above the sea. Near the Sookha Tal there is a curious circular basin, with steep and exquisitely wooded banks, known as the Mulla Pokhur or Upper Pool; it has formerly perhaps been permanently submerged, but, at present, for the best part of the year, forms a damp rich meadow, decked with primulas and buttercups.

From its vicinity to the plains, Nynee Tal enjoys the full benefit of the "Dhoon Breeze," and, unless in the wet season, its temperature is delicious; then indeed, its weeping climate appears to resemble that of the west of Ireland and Scotland; more rain falls than at Mussooree, and twice as much as at Almorah; the last being screened by the Gagur Range, which arrests and condenses the clouds to an incredible degree, and bestows on the lake the first and principal squeeze of the sponge which comes charged with the vapor of the Indian Ocean. After these falls, one is deafened by the incessant and vociferous chirping of innumerable cicadas: (*Cicada pulchella*.)

"Cantu querulæ rumpent arbusta cicadæ."

During the live-long night, the Singor, a small whitish owl, (*Noctua cuculoides*,) repeats its monotonous double note at intervals of a few minutes—the Nightingale of Kumaon.

"As the wakeful bird \

"Sings darkling, and, in shadiest covert hid,

"Tunes her nocturnal note."

These constitute the sum total of my entomological and ornithological knowledge of this locality; the following catalogue comprizes the more common plants.

Cupressus torulosa. The Cypress. "Soorye:" "Rai-sulla."

Pinus longifolia. The Pine. "Cheer:" "Sulla."

Fraxinus (Ornus) floribunda. The Ash. "Ungou."

Carpinus viminea. The Hornbeam. "Chumkhuruk."

Betula cylindrostachya, (or *nitida*.) "Puya-ooodeesh," i. e. "cherry-alder," from its leaves: or "Chumbur-muya," which is properly the Elm, not observed here.

Alnus nepalensis or *obtusifolia*. "The Alder." The pundits call this tree "Ootees," the Public, "Oodees" or "Oodeesh," doubtless from *ood*, water, with reference to its usual place of growth. The bark is used in tanning, dyeing, and in the preparation of red ink. The Almorah pundits consider "Ootees" to be a distinct word from "Utees," *Aconitum heterophyllum*: but in Dr. H. H. Wilson's Dictionary, the two plants appear to be confounded under "Utivisha"—"a tree used in dying: it is of three kinds, white, red, and black," from *uti*, overcoming, *visk*, poison. Hence "Utivish," *antidote*. There can be little doubt that "Utees"—*Aconitum heterophyllum*, is the corruption of this, and that Dr. Wallich (quoted in Royle's Illustrations, p. 47,) was misinformed when he rendered "Utivisha" by "Summum venenum." "Uti" no doubt is often equivalent to "much;" but neither of these botanists appears to have perceived the connection between *Utivisha* and *Utees*, though the uses to which the *Utees* is applied fully bear out Wilson's sense of "overcoming," and on my suggesting the correction to my Almorah friends, they acknowledged its justice. *Uti* is defined "much, beyond, over," and seems identical with the Greek preposition "anti," opposite, in place of:" falling in with the idea of *much* in Shakespeare's "vaulting ambition, which o'erleaps its sell, and falls on the other side." *Oopuvisha*, a synonyme of *Utees*, from *oop*, reverse, and *visk* poison, confirms this view. *Aconitum ferox*, which is truly *summum venenum*, is never called *Utees*, but "mour" or "mahoor" (Hindee), probably from *S. mudhoorum*, "sweet," "Poison;" of which "*meetha*," the common bazar name, is a translation. *Vishwa*, implying a dye, seems to have been the original word compounded with *uti* in the name of the Alder.

Quercus incana. Common oak. "Banj."

Quercus lanata: "Reeanj," "Ranj."

Quercus semecarpifolia : "Kurshoo," "Sanj."

Quercus dilatata : "Kilonj," "Tilonj," but often mistaken for the last.

Quercus annulata : "Phuliant," "Phuniat."

Acer oblongum : "Putunglia," "Putungulia."

Acer lævigatum and *A. cultratum*. Maple.

Symplocos paniculata : "Lodh."

Rhododendron arboreum : from 3500 to 10,000 feet. "Booroons," "Boorans." The pundits of Almorah affirm that this is the true "Bundhooka," "Bundhoojeevuka" of their sacred books, applied elsewhere, but with manifest uncertainty, to *Ixora*, *Pentapetes*, *Pentaptera* : all red flowers ; the word however merely implies that they were "bound" as garlands, a common practice in the mountains, especially with the rhododendron. The name in Nepal is "Gooras," evidently the Sanscrit "Goorashyu," a mountain *Peeloo* (Wilson), from *goor*, the saccharine fluid so abundant in the blossoms. The pundits can only say that Boorans, Booroons, are "*bhakha*;" if not mere variations of *Goorashyu*, they are probably from *vrindisht*, very beautiful or charming ; from *vrishnashun* (*Embelia ribes*), Bull-destroying : cattle are said to be occasionally killed by eating the flowers and young leaves. So *Nerium odorum* is called *Huyumaruka*, the Horse-killer ; or, from *vrish*, to sprinkle, to rain (honey or flowers.) Humboldt (*Cosmos*) quotes this rhododendron as attaining a height of 20 feet : he might safely have doubled that ; a specimen on Binsur is 13 feet in girth ; one at Nynsee Tal is reported to be 16. One, on Siyahee Deves is 14½ feet round at 5 from the ground.

Andromeda ovalifolia : "Uyar:" in Nepal "Ungiar," perhaps from the Sanscrit "anarogyukar," causing sickness : the young leaves being very poisonous to sheep and goats. The honey is also considered very deleterious.

Hydrocotyle hispida. (Mehula, Budhan Dhoora.)

Ilex dipyrrena : Holly. The fruit has frequently three seeds.

Ilex serrata ? "Gurashoon:" a superb tree in the vallies below Cheenur, to the S. W. and on Siyahee Deves near Almorah.

Prinsepia utilis : "Jhutela," "Dhutela."

Cerasus cornuta : "Jamuna."

Pyrus variolosa : "Mehul." Wild Pear : when black and rotten, the fruit becomes very sweet.

Pyrus baccata : "Gwala-mehul." Siberian crab, or a species very like it ; it is Common here, and along the Shamkhet stream : but does not occur elsewhere that I am aware of, till we approach the Snowy range.

Cratægus crenulata : "Geengaroo." White-thorn.

Cotoneaster affinis : "Reounsh." "Rous."

Cotoneaster mycophylla : "Gurree."

Photinia dubia : "Gur-mehul." "Soond."

Agrimonia nepalensis.

Potentilla nepalensis, and *P. splendens*.

Spiræa cuneifolia : "Jhar."

Rubus rotundifolius, *R. tiliaceus*, &c. "Heesaloo." Raspberry.

Fragaria indica, and *F. nubicola*.

Rosa Brunonii and *R. macrophylla*.

Limonia laureola : "Nehur." "Goorl-puta." This is the shrub alluded to by Mr. Ogilby, in Royle's Illustrations, p. 71, where we read that the Musk Deer is "said to derive its peculiar odoriferous secretion from feeding on the Kastooree plant, a kind of ground-nut, which is strongly impregnated with the same pungent scent, and which the animal digs up with its long tusk!"

Deutzia staminea and *D. Brunoniana*.

Cornus macrophylla : "Kagsbee."

Cornus oblonga, and *C. nervosa*?

Populus ciliata. The Poplar. "Chulnia," "Chounia," "Chan." "Gur-peepul."

Coriaria nepalensis : "Mukola."

Ruta albiflora. Rue. "Oopunya-ghas."

Rhus vernicifera : "Bhuliou." "Goor-bhuliou."

Sabia campanulata.

Xanthoxylon hastile : "Teemoor."

Tetranthera pallens, *cuipala*, and several other Laurinæ : "Kouwul."

Acacia mollis. The Pink Siris. "Burou."

Indigofera Dosua, and *I. pulchella* : "Sukena." The flowers of the last are eaten in times of dearth.

Desmodium elegans, *D. hexagonum*, and *D. parvifolium*.

Lotus corniculatus.

Falcatula (*Trigonella*) *pubescens*.

Argyrolobium roseum ?

Astragalus sesbanioides.

Astragalus chlorostachys.

Astragalus leucocephalus.

Cytisus flaccida.

} On Limestone.

Primula denticulata.

Primula floribunda, and *P. speciosa*. Low vallies : the first down to 2500 or 3000 feet : the lowest *Primula* in the mountains.

Androsace lanuginosa, and *A. rotundifolia*.

Parnassia nubicola.

Saxifraga ciliata : "Silphora."

Sedum sinuatum, *S. adenotrichum*, *S. pyriforme* ?

Pæonia Emodi. Discovered on Deoputa, by R. S.

Thalictrum radiatum, on trees.

Thalictrum foliolosum : "Peela-juree," "Yellow-root ;" exported to the plains as "Momeeree," where a larger kind, called "Momeera" is said to be brought from Persia, &c. Dr. Royle inclines to believe *T. foliolosum* to be the male plant of *T. neurocarpum* ; were it so, they would be truly diœcious, for the first flourishes from 3000 to 7000 feet, the second from 8000 to 10,000 feet above the sea, and flowers much later. But in fact the first, as noticed in Don's *Prodromus*, produces abundance of fertile flowers chiefly in July and August, with generally four carpels.

Thalictrum rupestre (provisionally,) a pretty species, not found N. W. of Kumaon, common on crags at from 6000 to 8000 feet elevation.

Delphinium pauciflorum : "Moonilla," Larkspur. The root is chewed on *Sundays* to cure toothache.

Aquilegia pubescens. Columbine.

Ranunculus lætus, and *R. vitifolius*. Buttercup.

Clematis montana.

Clematis velutina : "Ghuntiali," i. e. *Row of Bells*.

Anemone rivularis, *A. vitifolia*, and *A. discolor*.

Epilobium brevifolium. Don, E. læve, Royle.

Corydalis chærophyllum.

Berberis aristata : "Chotra." Berberry. Perhaps from S. Chitr pointed, variegated, alluding to the leaves ; or kshi, kshut, chrut, to hurt, wound, tear.

Hedera helix. Yellow-berried ivy. "Banda."

Cissus capreolata : "Punj-puta."

Ampelopsis Himalayana : "Chuhpara." "Chuppur-tung."

Lonicera diversifolia : "Bhut-kookra." "Cheraya-koormalee." Fly Honeysuckle.

Viburnum cotinifolium : "Gweea."

Viburnum mullaha : "Tit-muliya."

Viburnum cylindricum : "Kala Tit-muliya."

Kohautia coccinea : "Busooliya-ghas."

Rubia cordifolia : "Mujethee." Madder.

Galium latifolium, *G. asperifolium*, &c. "Kooree."

Hamiltonia lanceolata : "Pudera."

Abelia triflora : "Moonree."

Jasminum dispernum : "Soormalee."

Jasminum chrysanthemoides.

Jasminum grandiflorum : "Jahee." Very abundant chiefly in the low vallies towards the plains ; but also on Binsur up to 8000 feet.

Daphne cannabina : "Set-burwa : " both the white and purple flowering varieties.

Daphne sericea, (*Wikstroemia salicifolia* of Jacquemont,) "Chumlia." The Nepal paper is made from this and the *purple D. cannabina*.

Evonymus japonica.

Evonymus tingens : "Koongkoo : " i. e. smut or mildew.

Lychnis fimbriata.

Geranium lucidum, *G. nepalense*, *G. Wallichianum*.

Impatiens amphorata, *S. cristata* : "Booree-ka-til."

Impatiens Balsamina. (Boodlakot,) used as a dye, and hence called "Mujethee" or Madder.

Oxalis corniculata : "Chulmoree," or "Little sorrel."

Rhamnus virgatus : "Chudooa," Satin Thorn.

Rhamnus purpureus, and *R. procumbens*. The last on limestone.

Euphorbia involucrata.

Sarcococca nepalensis.

Myrsine bifaria. The so-called Box.

Myrsine semiserrata.

Myrsine acuminata : "Choopra."

Plantago lanceolata, and *P. major* : "Loohooria."

Polygonum amplexicaule, *P. punctatum*, *P. scabrinervium*, *P. amphibium*, *P. nepalense*, *P. indicum*, and *P. recumbens*.

Viola serpens and *V. reniformis*.

Elsholtzia polystachya : "Bhungureea." The so-called Lavender.

Elsholtzia strobilifera.

Teucrium quadrifarium.

Salvia lanata : "Gunnia." Sage.

Salvia glutinosa.

Origanum normale : "Bun-toolsee."

Plectranthus Coetsa, *P. patula*, *P. hispida*, *P. Gerardiana*.

Ajuga decumbens (or *parviflora* ?)

Nepeta leucophylla and *elliptica* : Catmint.

Leonurus sibiricus.

Stachys sericea.

Lamium petiolatum.

Prunella vulgaris.

Melissa umbrosa. (*M. flava*, on Binsur.)

Colquhounia vestita : "Bhilmora," "Bhermora," common also below Mularee and Budreenath, where it is called "Ungeeria."

Begonia picta and *B. dioica*.

Chirita bifolia and *C. Edgeworthii* : "Sunkh-pooshpa."

Platystemma violoides. Rock violet.

Scrophularia polyantha ?

Hemiphragma heterophyllum.

Pedicularis elegans and *P. carnosae*.

Cynoglossum canescens, *C. glochidiatum*, and *C. furcatum* : commonly called "Forget-me-not."

Dicliptera bupleuroides.

Strobilanthes attenuata.

Strobilanthes glutinosa—"Kupoor-nulee."

Aster bellidifolia : "Murch-mool."

Inula asperrima.

Serratula pallida.

Ainslisea aptera, and *A. pteropoda*.

Onoseris lanuginosa : "Kupasee," affords the tinder called "Kufee."

Antennaria cinnamomea, and *A. triplinervis*.

Antennaria semidecurrans. } All known as "Jhoola" and "Bokula;" the to-

Anaphalis decurrens. }
Gnaphalium multiceps. } mentum of the leaves and branches is
 much used for tinder and moxa.

Myriactis oleosa, and *M. nepalensis.*

Solidago nepalensis.

Senecio canescens.

Senecio Jacobæa ? *raphanifolia* ? generally considered to be *S. Jacobæa* : but in habit and site (shady woods) very different. The leaves are often of a fine purple-copper below.

Amphiraphis rubricaulis.

Conyza pinnatifida.

Calimeris flexuosa.

Artemisia indica, &c. "Patee." Wormwood.

Bidens bipinnata, and *Wallichiana.*

Siegesbeckia orientalis.

Carpesium.

Echinops nivea : "Kunyla." "Jou-kanda." Globe Thistle.

Echenais arachnoidea. N. S. Edgw., "Thunyla." White Thistle :
 6000—8000 feet.

Mulgedium macrorrhizum, and *M. robustum.*

Leontodon taraxacum, and *L. eriopus.*

Tragopogon elegans.

Morina Wallichiana.

Scabiosa Candoliana : "Nara."

Valeriana Hardwickii : "Shumeo." Perhaps *S. shumi*, from shum, to calm.

Gentiana marginata.

Ophelia paniculata.

Ophelia angustifolia.

Ophelia purpurascens.

Ophelia cordata.

Campanula pallida, and *C. ramulosa.*

Lobelia pyramidalis : "Kokilia." Glens, S. W. of Cheenur.

Marsdenia lucida : (Edgeworth :) a large climber over rocks and trees, at 7000—7500 feet, in the shadiest recesses of Uyarpatha, Siyahee Deves and Binsur. Its beautiful evergreen foliage and sweet purple blossoms would make it a favorite in English shrubberies in preference to *Periplota græca*. The only name is "Doodhee."

} Cherayuta.

Marsdenia Roylei: "Moorkeela." The fibre affords excellent fishing lines.

Ceropegia Wallichii.

Roscoea purpurea, *R. alpina*, *R. lutea*.

Hedychium spicatum: "Kuchoor-Kuchree."

Liriope (*Ophiopogon*) *intermedia*, and *L. spicata*. "White hyacinth."

Lilium nepalense, and *L. Wallichianum*.

Allium leptophyllum: "Peeria-luhsun."

Allium lilacinum: "Puderia-luhsun."

Allium ellipticum: "Sheeolia-luhsun."

Asparagus adscendens. "Khyrooa."

Polygonatum verticillatum.

Cyanotis barbata.

Commelyna obliqua: "Kana." Khunjura."

Satyrium nepalense: "Pukwa." "Dheemnee."

Habenaria intermedia, *H. pectinata*, *H. arcuata*.

Aceras angustifolia.

Spiranthes amœna.

Davallia elegans.

Pleopeltis nuda.

Polypodium vulgare, *P. quercifolium*, &c.

Pteris normalis, *P. cretica*, &c.

Asplenium tenuifolium.

Aspidium squarrosum.

Adiantum venustum. Maiden-hair.

Arundinaria falcata: "Vingala." Hill Bamboo.

Erianthus olivaceus. Woods, Uyarpatha; "Plume-grass."

Erianthus—: ditto—up to 7500 feet.

Juncus elegans. *Carex indica*.

Cymbopogon: "Peeria." Common aromatic tufty grass, from 4000 to 8000 feet: refused by cattle.

Andropogon calamus aromaticus: "Boojura." Cattle will not touch it while they can get anything else.

Rhaphis Roylei. "Salim:" covers all the more shaded parts of the higher mountains, and though very useful for thatch is too coarse for cattle: Nynee Tal is thus badly off for pasturage. A species of *Triacetum* occupies the sunny crest of Cheenur.

The Magnolia, which was supposed to grow at Nynee Tal, does not exist: the dioecious tree that was mistaken for it, is probably, Mr. Edgeworth informs me, what Dr. Lindley has described under the name *Gyandra laurina*; it is not uncommon in damp vallies in outer Kumaon at from 6000 to 7000 feet, and is known to the natives as the "Rukt-Chundun"—the red-heart wood, being used like the Sandal, to mark the teeka on their foreheads.

December 12. From Nynee Tal to Kaleedhoongee, 12 miles, with 5700 feet descent. On quitting the basin of the lake by "the Abelia Pass," the road descends rapidly by the "Glengariff Dell," choked, as before mentioned, by a labyrinth of limestone masses from Deoputa: at 2 miles, pass the Surria Tal, a swampy basin, 5625 feet above the sea (R. S.) and at 3 miles, the Koopaka or Koorpa Tal, a pretty circular tarn in the region of *Pinus longifolia*, 4931 feet (R. S.) the Ghivalee cliffs are seen to great advantage from this point. Still lower 3771 feet, (R. S.) we pass Sirmouria, the "Swing" village, so called from one of the gallows-like frames on which the hill men amuse themselves during their festivals; the vegetation here begins to assume a decidedly tropical aspect. Near the 6th milestone is Kala-putthur, a halting-place which has its name from a boulder of dark limestone, 2571 feet above the sea (R. S.) The road now becomes comparatively level, along the broad shingly bed of the Nihal, at present carrying but a small stream, which a little lower down, is entirely absorbed by the gravel and sand. The water is charged with lime, which is described as so cementing, at particular seasons, the floor of its channel, as to form for itself an impermeable trough, which carries it on much farther, than when a larger and more violent volume of water descends and breaks up the crust. An attempt was made to carry a causeway along this bed of shingle down to Kaleedhoongee: but "Leviathan is not so tamed:" the torrent breached, and finally annihilated the work during the rainy season of 1847, as every one predicted it would, except the public-spirited, but too sanguine projector. The mountains, richly wooded, and composed of marls and sandstone, may be said to be left at Kala-putthur, though their ultimate branches hug the right bank of the Nihal to within 2 or 3 miles of Kaleedhoongee, when the road enters the forest. This, excepting the Kaleedhoongee clearing of about two miles in length, is continuous 8 or 9 miles on to Boorhenee

on the Moradabad route, where the swamps and prairies commence, terminating about 20 miles from Kaleedhoongee, at the village Manpoor, near the left bank of the Kossilla. The Bhabura staging Bungalow is near Manpoor, but is in bad repair, and the climate is unhealthy till the middle of October or later: Durial, on the opposite bank of the Kossilla, is considered safe.

The Bazar at Kaleedhoongee is neatly built, and being now crammed with supplies for the use of the 31st Regiment on its march from Almorah, appears more like Mark Lane than a poor hamlet in the "Belt of Death." It stands in the angle between the Nihal and the Boula torrents—the latter, from the Kotah Dhoon, once infamous for the stoppage of travellers and the Post, is now permanently bridged.

The elevation of Kaleedhoongee is about 1100 feet above the sea; the name implies "black stones," but refers to a site nearer the mountains. The vicinity of the public Bungalow is shaded by magnificent specimens of the "Huldoe," *Nauclea cordifolia*. This tree is the glory of the Kumaon and Gurhwal Bhabur; fortunately its wood is of no great value, and is chiefly employed in making up opium chests; and writing tablets; it thus escapes the axe of the feller. From its yellow color, one would refer the etymology to *Huldee*; but Wilson gives the Sanscrit from *huri*, a monkey, *doo*, to go: reminding us of Baron Hugel's observation cited in *Kosmos*, that in Kashmeer the large white ape with the black face inhabits the Chestnut trees. These restless creatures cannot well be said to inhabit any particular tree, frequenting those indifferently on which they feed. At Kotah, I noticed them greedily devouring the iron-like pulse afforded by the *Siris*, *Acacia speciosa*, a meal implying most potent gastric juice.

Between Nynee Tal and Kala-putthur, the most usual trees, &c. are *Ceanothus flavescens*: "Ghant."

Olea glandulifera (or *compacta*): "Gyr." "Guldoe." "Guroor:" 2000 to 4500 feet.

Pittosporum eriocarpum: "Meda-toomree." "Gur-silung."

Hamiltonia lanceolata, and *H. cærulea*: "Pudera."

Wendlandia cinerea: "Choulæe." "Cheela." "Chilkiya." "Teela."

Clerodendron odoratum: "Monee."

Bæobotrys indica: "Kulsees?" From 2000 to 5000 feet.

Itea nutans : "Gurkath."

Leucomeris spectabilis : "Punwa." "Pundoos." Common between 3000 and 4000 feet ; rarely up to 6000.

Engelhardtia Colebrookiana : "Moua." "Gobur-moua." "Bodul-moua."

Conocarpus latifolia : "Bakla." "Baklee." Its leaves are exported to the Plains for the use of the tanners ; the timber, under the name of *Dhau* is considered excellent in Rajpootana, but seems in small request here. The Sanscrit *Vukoola* is applied in Bengal to *Mimusops elengi*. The *Conocarpus* imparts a fine copper tint to the forests in winter.

Erythrina suberosa, and *E. stricta* : "Roongura." Dr. Royle seems to consider the *Erythrina* of the Dehra Dhoon to be *E. spathacia* : the commonest species of similar localities in Kumaon agrees best with *E. suberosa*.

Bauhinia vaiegata, var. *candida* : "Khwyral." Abundant in all the warm glen below Nynee Tal, and from the Kosilla to the Kalee, flowering in April. It does not appear to extend as far as Mussooree, the "Khyrwal" of Gurhwal being *B. purpurea* ; nor apparently south towards Silhet, for Roxburgh had only found it in gardens. "Khyrwal" is evidently the Sanscrit *Khurvullica*, "sharp or sour pedicel:" the flower-buds being made into pickle. *B. variegata* is the *S. Kovidar*, and Dr. Royle's *kobdar*, *Illus.* p. 185.

Acacia ——— ? "Kureo," an immense tree with white bark.

Oxiramphis sericea, (mihi.)

Lindenbergia macrostachya.

Ophelia angustifolia.

Lantana dubia.

Cuscuta grandiflora : "Akash-lugoollee."

Porana paniculata.

Holmskioldia sanguinea.

Barleria cristata.

Lepidagathis cuspidata.

Sterculia Wallichii ? "Boduba."

Zingiber ligulatum.

Costus speciosus : "Keoo." "Keolee." It is curious enough that the Sanscrit names *Kushmeer*, *Kushmeerju*, of the true *Costus*, the

“Koot” and “Puchuk” of commerce, (*Aucklandia Costus*) point out the country where Dr. Falconer discovered it, beyond which, it is not known to exist.

Saccolabium guttatum.

Vanda cristata.

Cælogyne nitida.

Pholidota articulata. All and others generally known as “Banda;” and, especially the last, by the doctrine of signatures, in much estimation as “Hurjoj” and “Hurjor” for uniting broken bones: though probably quite inert.

From Kalaputthur to Kaleedhoongee occur,—

Nauclea cordifolia: “Huldoe.”

Nauclea parvifolia: “Phuldoe.”

Bignonia (Calosantes) indica: “Phurkuth.”

Bignonia suaveolens: “Padul.” “Pudeeala.”

Odina Wodier: “Jinghun.” “Jeebun.”

Sterculia villosa: “Oodial,” a strong rope is obtained from the fibres of its bark.

Capparis horrida: “Oolta-kanta.” “Bipooa-kanta.”

Capparis sepiaria.

Polanisia viscosa.

Ehretia lævis: “Kodah.”

Orthanthera viminea: “Chupkeea.”

Calotropis gigantea: “Ak.” Both white and purple.

Pergularia pallida? “Soorkeela.”

Ventilago maderaspatana.

Vitis latifolia.

Artocarpus lacucha: “Dhou” “Duhoo.” But apparently only near the clearings.

December 14.—To Kotah, six coss N. W. The low range of hills which beyond the Ganges is called the Sewalik, commences about three miles to the N. W. of Kaleedhoongee, and forms the Kotah Dhoon. The Boula, Bola, or Bol river, a large brisk stream, which rises on the S. W. face of Cheenur, waters its eastern portion copiously, and issues by its S. E. angle to join the Nihal below Kaleedhoongee. In this angle, Mr. Batten informs me that a hot spring exists, an interesting phenomenon in such a locality, which escaped my notice. The route

to Kotah, a mere pathway, lies for about six miles through dense forest, frequently crossing the stream : and then over the cultivated lands of three clearings and settlements of the mountaineers, Huldoobujoonia, Putulia, and Gintee. A little beyond the last are three large mango topes, called the Okulee, Sheenath, and Bhurutgiri *Bageechas*, in the first of which, covering 25 acres, is the usual encamping ground, by the high road from Tiaree to Chilkiya. The elevation is probably 2000 feet or more above the sea. Immediately north, and perhaps 100 feet below the road, is the channel of the Dubka river, about a mile over partly cultivated, but chiefly given up to thorny jungle and shingle. Three distinct terraces are traceable in this channel, formed by the river at various epochs : the main and highest bank, of boulders and gravel, has been scooped out into a flat curve. Along this plateau proceeds the road to Polgurh, where the river has forced its way through the low ranges into the Plains : the land in this (S. W.) direction is beautifully cultivated for two or three miles, irrigated by *Kools* from the Dubka, which is totally exhausted in the valley—being a very useful servant, though a bad master. It carries off the drainage of a great extent of lofty mountains, and the size and number of the boulders in its bed fully confirm what the people tell of its volume and violence in the wet season ; the attempt to cross is then frequently fatal, and hence the name, from *dubna*, to overwhelm.

The village of Kotah is a miserable place about three miles above the Okulee *Bagh*, on the opposite bank of the river where it emerges from the mountains by one of the most magnificent gorges in the world. The course of the stream is here diverted by a bluff, on which are the ruins of Kotah Gurhee, defended by thick stone walls, wooded precipices, and cut off from the cultivated ground to the S. W. by a narrow but deep ditch. The position is good, but so unhealthy in the rainy season, that the Gorkhalee garrison, consisting of one company, was forced to retire to Dola, another fortified post on a lofty mountain behind.

On the same bank, but lower down, and nearly opposite the Okulee *Bagh*, is the romantic temple of Deveepoor, about 200 feet above the river, on a low range of woody hills, here carved into a ridge by a confluent stream which pours down a narrow, but wild and lovely dell from the north ; in this paradise a man was killed by a tiger about six

days since. The temple commands beautiful views of the mountains, the outer ranges, and the Dhoon, all, except the few clearings, enveloped in forest. About a quarter of a mile east of the temple, I was surprised to come on a mansion and petty settlement, closely hemmed in by the wilderness, the present residence of Purmen Singh, uncle of the (by courtesy) Almorah Raja ; he has some villages at Kasheepoor, but came to this "sacred storehouse of his predecessors," to supplicate the goddess, and to shoot, with small success in either object, being laid up with fever.

To the east of Kotah the Gagur presents a group of three lofty peaks, probably 8000 feet high, separated from Cheenur by the *col*, Pungoot or Punota ka khet, about 7000 feet high, where the Boodlakot villagers raise some wheat, nominally for their own use, but really for that of the Jurao, Ghoorul, and other deer which swarm in the woods and rocks. Immediately N. W. of the three Kotah Peaks is the Budhan Binaik : then the Budhan Dhoora, 8500 feet high, where the Gagur turns west to Souchulia, a point of similar altitude, with a Trigonometrical Chubootra, determined to be 8526 feet, due N. of Putulia ; and terminates in the huge rounded, rocky summit, known as the Devee ka Dhoonga and Bahmuneer ka Danda. This, which will probably turn out the highest point of the range, is marked by a *barrow* in the great map, and radiates in every direction : one branch descends west to Dhikolee, another south to Dola and Kotah forts. The Kotah Peaks send off to the S. W. a great spur called the Kureel ka Danda, on a point of which above the Dhoon is a *murhee* or cairn, sacred to Teet Devee. All the waters between Bahmuneer Danda and the Kotah Peaks unite to form the Dubka, as the Kureel and Dola spurs do the Kotah Pass ; up this lies the high road to Almorah, through a glen remarkable for its extremely wild and savage scenery : for many miles there is not a vestige of cultivation, or indeed any space for it : nothing but steep and dense forest, or extensive landslips, which occasion many a wearisome ascent in what would otherwise be a gradual rise. Before this road was constructed, it is difficult to imagine how it was traversed : yet the fort at its base (Kotah) and another (the Gagur Fort of the map about 200 yards N. W. of the summit) imply that then, as now, it was greatly frequented and carefully guarded. The crest is the most level of all the Gagur Passes ; and is known as the Budhan Binaik, or simply

Binaik. Dr. Wilson gives us as the signification of "Vinayuk," "an obstacle," &c. : but as modernized in Kumaon, the import is that of "a Pass," originally perhaps defended by entrenchments, and therefore equivalent to "a Barrier."

The rock at and above Kotah Gurhee is the usual sandstone ; above this is limestone : the three Kotah Peaks seem chiefly quartzose rock, and Budhan Dhoora, the same mixed with slate, dipping N. E. as usual ; an eruption of greenstone occurs at Sour village on its southern declivity.

The vegetation of the Kotah Pass differs little from that of analogous localities ; about half way up, at Sut-dhoonga, the rocks and trees are covered with graceful festoons of *Hoya lanceolata* or *pendula* : and every where the damper and shadier recesses are overgrown by the beautiful reed-like "Ounsa," *Thysanolaena agrostis* (*Agrostis maxima*, Roxb.) of which the leaves are considered excellent fodder for cattle. This plant, which penetrates by the vallies to the base of the snowy range, disappears at Almorah. *Grewia hirsuta* (W. and A.) occurs below Sut-dhoonga.

Jatropha curcas : "sufed Eend," is common about Kotah, and generally along the base of the mountains.

The forest in the Dhoon is generally constituted of—

Schleichera trijuga : "Koosum." "Gousum," yields an edible fruit, and a hard, heavy red timber, much used in sugar-mills, &c.

Falconeria insignis : "Khinna." "Kheena." 40 to 50 feet high : it is found in the mountains up to 5500 feet, reduced to about one fourth the height, and universally killed to the ground in the winter of 1846-47. The acrid milky sap is said to be poisonous, and very dangerous to the eyesight, like *Khirnee* (*Mimusops Kauki*, the name is probably derived from this milk, (Ksheer.)

Bassia latifolia : "Muhooa."

Alstonia scholaris : "Chhatiyoon" and "Sutiyoan." Nowhere uncommon in the Kumaon Bhabur : I have met it near Khuruk in the Dehra Dhoon.

Diospyrus lanciæfolia : "Urdinia:" extends to 3500 feet on the outer range.

Cocculus laurifolius : "Tilbura ;" often confounded with "Kir-kiria" and "Kikra," *Cinnamomum albiflorum*.

Smilax macrophylla : "Kukurdar."

Syzygium Jambolana : "Jamun." "Phounda." The fruit is that of Roxburgh's *Eugenia Jambolana* : the leaves, those of *E. caryophyllifolia*.

Syzygium ——— : "Rae-jamun;" a very large, distinct, and handsome species, still more abundant in the forests of the eastern Bhabur : unknown in those of Gurhwal.

Vitis latifolia : "Pun-lugoola." "Bhyns-umlee." An immense climber, with cable-like stems, sometimes 2 feet in diameter. The first name imports "water-climber;" probably it is one of the species which in spring afford large supplies of sap.

Vitis tomentosa : "Chuppurtung." "Cheprain." "Ameela;" very common, and reaching up to 6000 feet in the mountains : Dr. Royle traces this species up to Monghir only : in Kumaon the leaf is always trifoliate.

Hymenoduction (excelsum?) "Bhoulun." "Bhulena" "Bhu-meena." "Dhoulee," an enormous deciduous tree. Towards the Sutluj, this or an allied species is, under the name of "Burtoo," in much request for sword scabbards.

Ficus oppositifolia : "Totmeela."

Ficus cunia : "Kewnia;" (hence the trivial name;) the "Jurphul" of Gurhwal : it occurs from the lower border of the grass tarai up to 4500 and 5000 feet in the mountains.

Ficus cordifolia? "Gujeeoon." "Gujeena." Much resembles the Peepul, as well as the "Pilkhun" of Gurhwal (*F. venosa?*) if indeed it be different from the last. The Gujeeoon is found up to 4000 feet in the mountains, and is frequently parasitical on large trees, the trunks of which are enveloped in a white network composed of its innumerable roots, and finally destroyed by them. The Gujeeoon then consolidates into a stem "deeply furrowed, as if composed of many coalesced trunks." (Roxb.)

Ficus indica : "Bur," (i. e. best or greatest,) and "But," (i. e. *Fut*, to tie, its hanging roots being still used as ropes in Dinaj-poor, Buchanan.) This tree does not ascend the mountains : it is considered sacred, and its root-stems, which from their toughness and elasticity make excellent poles for dandees, &c., are not cut till the in-dwelling, arborescent god has been appeased by the sacrifice of a goat—that luckless beast which on every occasion bears the brunt of the sins, real and imaginary, of all Kumaon.

Ficus religiosa : "Peepul," from *pa*, to preserve; the practice of all India bears out the etymology; not even a sacrifice atones for the crime of wounding and maiming it, and fortunately the wood is useless. This noble tree, abundant in the forests of the Bhabur, is planted as an exotic by the temples at Almorah, where it is sorely nipped in severe winters. It is worshipped on Saturday with "geetgan" (hymns) and the "purkuma" (prukuma) or great circuit, performed by parties of women. It is "the Tree of Knowledge," Bodhidrooma of the Hindoo mythology; or simply "Bodhi," intellect, knowledge. Hence the famous Bo-tree of the Buddhists. It is perhaps fanciful to connect "Bo" and "Bur" with the Bo-tree or Bour-tree (elder) of western Scotland, with which many superstitious notions are associated: and still more so to conjecture that the islands Arran, Bute, &c. derived their names from the worship of Buddh, established in that far-west by the messengers of king Piyadasa, the spiritual father of all missionaries.

Sanscrit synonymes for the Peepul are "Nagbundhoo," "liked by elephants;" "Koonjurashun," "food of elephants;" also "Gujashun," and "Gujbhukshuk," to the same effect: which is so true that the spots selected for pitfalls are, if possible, near this or the Bur. Munaka, S., for an elephant, is from mun, to think, to understand; and Locke avows his opinion that "dogs and elephants give all the demonstrative of thinking imaginable, except only telling us that they do so." (Essay, B. II.) The Hindoos have deified the sagacity of the elephant in Gunes, and perhaps supposed that it was attained by feeding on these trees. Here is a *rational* origin of the Tree of Knowledge—only permitted, however, to a German Professor! Milton ventures to affirm that the paradisaical Fig was no other than *Ficus indica*, and that its leaves formed the first clothing of our first parents; a moral and poetical retribution if the Banian tree may also be considered a tree of knowledge: "the Bráhmans," says Roxburgh, "are partial to the leaves of this tree to make their plates to eat off; they are jointed together by inkles." Hence if existing eastern names and notions are to be our guides in interpreting the records of oriental antiquity, after the method of Burder and many others, we must realize the Tree of Life—the Shujrut-ul-hyat—in *Cupressus sempervirens*; and the Tree of Knowledge—Bodhidrooma, in *Ficus religiosa* or *F. indica*, while

a new interest is thrown on the plains of Hindoostan by their identification with the seat of the terrestrial Paradise, "Eastward in Eden." The conquests of Cyrus would carry the Mythus into the western hemisphere.* Pliny, stating that the fruit of *F. indica* is rare, and not above the size of a bean, adds, "sed per folia solibus coctus prædulci sapore, dignus miraculo arboris." One of the Sanscrit names is *Vrikshadun*, Food-tree.

Abrus: a pretty climbing species, perhaps the pulchellus of Wallich, is abundant in the hedges about Kotah, and in the mouth of the Pass: it is called "Luggoollee Imlee," "climbing Tamarind," and is, I think, confined to this neighbourhood.

Mimosa pudica: "Lajuwunttee." The sensitive plant is completely naturalized, and grows everywhere about this part of the Kotah Dhoon.

Saurauja nepalensis. Vallies at 3000—4000 feet.

Pladera virgata: (by Kools.)

Ipomea pilosa, and *I. hirsuta*. (Bed of the Dubka.)

* In an analysis of the *Pudma Paran*, given in the *Journal As. Soc.* for 1842, No. 131, pp. 1129, 1130, we have a further and very curious illustration of this subject conceived in the spirit of indelicacy and piety so familiar to the Hindoo mind:

"It came to pass that the wives of the Tripoorasoors were dancing round the *Uswutthæ* (*Peepul*) which is the king of trees, and endeavouring to obtain the fruit which hung from its lofty branches. Vishnoo, assuming the form of a priest, told them that they would not be able to procure the fruit unless they danced round the tree naked. On their obeying his injunction, Vishnoo, pervading the tree as he pervades all things in heaven and earth, shook it with a noise like thunder: the women, being frightened, clung naked round the tree, which immediately assumed the form of a naked young man, in whose embraces they enjoyed the fruit of their desires, but lost that virtue which gave immortality to their husbands."

On a former occasion the suggestion was ventured that *Peepul* and *Populus* are the same word: "*Gur-peepul*" is an usual name of *P. ciliata* in Kumaon: and it is evident the received etymologies of *Populus* are forced and uncertain. *Bullet (Arboretum Britannicum)* thinks it was so called from the motion of the leaves resembling the acts and thoughts of a free and enlightened but fickle populace: others that it arose from the circumstance that the public places at Rome were planted with this tree, hence called *arbor populi*, as the Spanish *Alameda* is from *alamo*, for the same reason. But why did the Romans select the Poplar? May it not have been from some lingering association brought by their ancestors from the east: their language is full of Sanscrit forms and terms: why should not Sanscrit ideas have been imported with them, and the Poplar chosen as the best representative of the *Peepul*? The latter is sacred to Vishnoo, the sun: and we find the former connected with the legend of *Phaëthon*, whose sisters, the daughters of the sun, were metamorphosed into *Poplars*.

Verbena officinalis.
Bidens Wallichiana.
Hamiltonia azurea.
Scutellaria repens.
Shuteria involucrata.
Triumfetta oblongata.
Abutilon oxyphyllum.
Leea Sambucina.
Cheilanthes dealbata.
Adiantum Capillus Veneris.
Adiantum rhizophorum.

These descend in the Pass to the
 level of Kotah Fort, perhaps
 2500 feet.

Lygodium japonicum : about the Kotah Bagheechu.

Hibiscus cannabinus, "Sun," is cultivated to a small extent in the fields about Kotah : *Crotalaria tetragona* is wild : but the "Sunai" *Crotalaria juncea*, appears to be unknown.

December 15.—To Seetabun, about 6 miles W. S. W. The route crosses the Dubka, of which the right bank is high and precipitous ; the broad stony valley is tangled with *Acacia catechu*. Beyond the river, the path lies through Sal forest, gradually descending with the course of a stream, the Dhancee or Chuhul, from the eastern flank of the Bahmune ka Danda : this, at Seetabun, is joined by the Bahmune, a large stream, rising in the N. W. of the range so called : the united current under the name Kichree, breaks, by a romantic pass, through the great plexus of jungly hills here forming the outer range, and ultimately joins the Dubka in the outer forests. The scenery about Seetabun is extremely wild and beautiful ; Sal, of noble dimensions, occupies the plateau of level, uncultivated land between and west of the streams ; and beyond the forest, to the N. E. rises the brown ridge and summit of the magnificent Bahmune ka Danda, not unlike Budraj, as seen from the Dehra Dhoon. Patkot, an extensive clearing, lies at its base. There is no cultivation at Seetabun, nor does any road exist for the transport of the timber ; the spot owes its name and celebrity to the legend that, at the confluence of the two streams, the persecuted dove, Seeta, found *repose* after her abduction by Rawun ; and though the site be considerably out of the line of operations between Oude and Ceylon, a grove of *Asoca* trees (*Jonesia Asoca*) flourishes in proof of the fact : introduced, no doubt, by the Gossains, and other

"Ochreous Saints" who abound here, to shade and sanctify the shrines, which, however, are few, and unworthy of the extreme beauty of the spot. Its mythical fame, which seems to be connected with that of Doonagiri, attracts a considerable number of the pilgrims who visit Hurdwar, and on these the Ministers of Seeta subsist, the soil producing no other available commodity.

The outer range behind Seetabun is lofty enough for the growth of *Pinus longifolia*: and the climate of the holy spot is at this season disagreeably cold and damp by night, with a warm sun by day. Here I had the advantage of a meeting with my friend Mr. J. H. Batten, administering to the foresters the Adil-i-Nousheerwan, and to myself many valuable hints regarding the routes and natural curiosities of the Province.

The vegetation of Seetabun is that of all the higher and richer sites of the Bhabur, consisting of—

Vatica (Shorea) robusta: "Sal." "Sakhoo."

Semecarpus cuneifolia: "Bhuliou." "Bhilawa." Marking-nut Tree.

Careya arborea: "Koombh." Gun-match is made from its bark.

Antidesma diandra: "Surshotee," "Surshetee," "Umlee." The last name is from its acid fruit and leaves.

Putranjiva Roxburghii: "Jootee." "Pootrajiva."

Grewia elastica: "Phursia."

Randia longispina: "Thunela."

Strobilanthes auriculata: "Til-kupooree."

Ficus Tsiela? Kuth-bur, (about the Temples.)

Morus lævigata: "Shah-toot." "Siyah-toot."

Mucuna atropurpurea: "Kala-goncha." "Bul-dhaka."

Tephrosia candida: "Lehtia." Its leaves are employed to poison fish.

Butea parviflora: "Moula." An immense climber which penetrates by the hot vallies a little way into the mountains; it may be seen in abundance on the Kansrow Pass near Hurdwar. Overlooked in Dr. Royle's Illustrations.

Clematis Gouriana. Most abundant.

Asparagus racemosus: "Eilora."

Curcuma angustifolia. To 6000 feet on Binsur.

Zingiber ligulatum, and *Z. capitatum*.

Zingiber elatum: "Kuchoor." A favorite food (with the others)

of the porcupine and wild hog. It is dug up in February all along the foot of the mountains, and sent for sale to the Plains, where it comes into use as a medicine.●

December 16.—To Dhikkolee Pass, (the Dhekulo of the map,) perhaps 10 miles, W. by N. About half the distance is over high table-land, covered with forest, the rest is along a series of most picturesque glens, the floor and acclivities equally clad in the same dense and beautiful forest. Close on the north rises the westernmost prolongation of the Gagur, which terminates at Dhikkolee in this long, wooded, spur. It sends down a multitude of torrents, which, with those of the vallies towards Seetabun, form the Kukrar or Kukuree-nudee, carrying a brisk stream along the usual wide and strong channel, adapted to the Rains supply. It joins the Kosilla at Dhikkolee, where the latter river, though rapid, is now shallow and easily fordable. Nothing can be more exquisite in scenery than its cliff banks and shaggy hills, enlivened by flights of birds, which are comparatively wanting in the waterless forests of the plateaus; or, where present, belong to genera which only make the loneliness more marked by their melancholy notes. Amongst the former the most noisy and remarkable is a large brown-bodied and white-crested thrush *Bolia* or *Gelooa*, gregarious in flocks of 15 or 20, whose only enjoyment seems to be constant chattering: *Cincoloma leucolophum*?

Dhikkolee is merely a Chokey in the Pass, 1308 feet above Calcutta: about a mile higher up is the usual encamping ground. On the hill to the west there are the ruins of stone houses, wells, &c.; perhaps the barracks of the Gorkhalee garrison. It was by this Pass, which ends about six miles down, that our army penetrated into Kumaon in 1815: no opposition was encountered, and the route, which is decidedly the easiest into the province, was perhaps indicated by some of our secret friends at Almorah.

The sections cut here by the Kosilla exhibit thick and nearly horizontal beds of a very stiff, and frequently much indurated red and yellow clay, which includes the river bed, and underlies thick strata of stones, gravel, and earth, which support the forest. This red clay is said to be the substratum of the vegetable soil of Rohilkhund; and the formation appears to be identical with that of Upper Assam. At Dhikkolee, on meeting the clay-beds, the water of the gravel, &c., is forced

out, and is seen to dribble down the cliffs in tiny rills. On receding ten to fifteen miles from the mountains, these beds of clay come to the surface, bringing up with them the accumulated waters of the great gravel talus above, and thus forming the swamps and morasses, which are so deadly in autumn to all but the Boksars and Tharoos, two tribes who pretend that they pine and die if removed from their native malaria.

The thickness of the gravel deposit all along the base of the mountains is enormous: half way between Tanda and Bumouree it was pierced to the depth of 150 feet, without reaching the bottom; the consequence is that the forest tract, immediately beyond the base of the mountains, has no water but such as is supplied by Kools, or artificial cuts from the streams before they are absorbed; at Dehra, Captain Herbert informs us that the gravel bed is 220 feet thick. We may suppose that while this tract still formed the bed of the ocean, the great rivers brought down the materials, which the currents distributed along the shores, just as the silt of the Nile, which the direction of the river would carry north, is, by the ocean-current, deposited far to the East towards Pelusium. That this process has, however, been partial, appears from two facts; 1. The gravel extends farther along the line of the rivers than elsewhere: 2. Its composition is said to exhibit a general conformity with the rock peculiar to the mountains in the rear. One point is certain: everywhere along the crest of the Sewalik range, we find the same water-worn pebbles as at its base: imbedded in sand in a position which, from their flatness, they could not have assumed naturally. The chain was, therefore, elevated after the deposition of the gravel, and on the same plan as the great ranges behind it, i. e. with its steep walls and cliffs facing S. W. and forming to the N. E. gently inclined planes, by the dip of the strata in that direction; a phenomenon equally true of the Himalaya viewed as a whole; the slope on the Tibetan side contrasted with the abrupt front presented to India, being a conspicuous feature in the narrative of every traveller who has passed the snowy crest: it may be compared to a sea, with the billows all breaking towards the S. W. Partial exceptions may be observed; abreast of the Bahmunee Danda, the low, exterior range rises in steep cliffs to the N. E. at Nynee Devee on the Sutluj, the temple occupies a pivot in the second range, on one side of which the strata dip toward the Plaius; on the other, toward the snows.

The strata of sand and marl which contain the fossils of the Sewalik seem to underlie the great mass of gravel, which thus forms a sort of chronometer to assure us of the immense period which has elapsed since they lived : as the enumeration of the species—horses, camels, hippopotami, tapirs, crocodiles, tortoises, &c.,—proves the change which has occurred in the “physical Geography” of the tract where they flourished—the site of the actual Himalaya ; the nature of these animals would lead us infer much of it to have been then rather a level country than the reverse ; and that doubtless, was the period when the *Ziziphus* grew at and gave its name to Budureenath ! Under this aspect the upheavement of the Sewalik ranges was probably synchronical with that of the great granitic axis itself, and a consequence of the same forces. Although intermitted in the most of Kumaon, the Sewalik appears to be reproduced in the Chiriaghattee and Bichiakoree ranges which separate the valley of Nepal from the plains of Tirhoot. But these speculations intrude needlessly on the province of Dr. Falconer, and are only excusable by the circumstance that his work has not yet reached Kumaon.

December 17.—To Mohan, about 7 miles up the right bank of the Kosilla, on its west side, and 276 feet above Dhikkolee. A violent and bitterly cold wind blew down the Pass all the morning lulling about 10 A. M. when the air became calm, and the sun’s rays oppressive. About two miles up the river, the hills recede on each side, leaving a level valley, which, with the exception of one or two small clearings, consists of poor stony land, overrun with low jungle : on the hills the forest is unbroken. This area must have been occupied by a lake, till the Kosilla cut through the Pass ; in which an isolated pyramidal mass of clay and gravel, standing out of the river, remains the momento of the departed mountain. At Mohan, the Kosilla makes a great bend from the east, and properly turns the western extremity of the Gagur ; on the opposite or East bank is Chookum village, with a spacious flat, laid out in rice of the first quality. Its cultivation is the inducement to occupy a spot, of which the appearance of the people attests the insalubrity ; they perish in raising the staff of life. The fever becomes virulent in Asar, (June-July,) and lasts till Assouj, (September-October,) but is most fatal in August and September. The presence of the Maloo (*Bauhinia Vahlia*) is one of the tests by which, in the opinion of the

mountaineers, the unhealthiness of any particular spot is established; it is most luxuriant in the Dhikkolee Pass, and generally up to 3500 or 4000 feet. But Chilkiya Munde, in the open grass and *Byr* jungle, is, in spite of Pilgrim's reclamations, just as deadly as the closest forest, and is equally forsaken as soon as the rains set in. (There is, however, a long belt of forest south of Chilkiya.) The source of the malady is supposed by the people to lie wholly in the bad quality of the river water: and they state that when well water is drank, there is comparative impunity.

Just now the communication between the mountains and the Munde is brisk and constant: large parties of the mountaineers of Gurhwal constantly passing to and fro. These people prefer fording the river frequently, in the Pass, to the ascent of 400 or 500 feet which the road makes on its left flank: for no consideration will induce a hill man to mount where he can keep to a level, or to make a circuit where he can go direct. So far as I met them, the Gurhwalees appeared a smaller and darker race than the people of Kumaon: they are abundantly national nevertheless, and sneered at the notion of Kumaon comparing with Gurhwal in richness of vegetation. The Ramgunga river they invariably term Ruhut or Ruput, a name which we meet far eastward in the Rapti, originally Revutee, from *rev* to leap, to *rare*, a very significant appellation of most of the Himalayan streams. On the higher ranges North of the Mohan valley stands or stood a fort, Kath ke Nao—the wooden boat, an odd name of which I could not discover the cause: it was held by a Gorkha garrison, which fled on the advance of Sir Jasper Nicoll in 1815. The made road is continued in this direction to Budreenath. The *Ipomœa quamoclit*, *I. pes-tigridis*, and *I. muricata*, the *Argyrea strigosa*, *Pharbitis Nil*, and *Coccinia indica*, are common plants in the Mohan and Dhikkolee woods: *Tabernœmontana coronaria* also grows wild here. The *Argyrea strigosa* abounds in the Bhabur and penetrates the glen of the Surjoo as high as Kupkot: the *Pharbitis Nil* (Bounra) flourishes up to 5500 feet at Almorah. From one of the clearings, the people brought a young Jurou for sale (*Cervus aristotelis*?) only 10 or 12 days old they said, and quite unable to walk, it is now at twelve months old 3 ft. 8 in. high (the horns 3 inches long) and exceedingly strong. It is curious to observe the instinct of excessive caution and vigilance with which nature has endowed it, as

well as the perpetual action of its large ears, the apparatus by which these qualities are exercised : and that too where no real danger exists : but proving the numerous enemies to which it is exposed in a wild state. Unless when at speed, not a step is made without the ears being thrown forward to gather the slightest sound : and if this be any way unusual, the angry and repeated stamp with the forefeet is the signal to its companions for immediate flight.

December 18.—From Dhikkolee camp to Chilkiya Mundee, 10 or 11 miles south. In about one mile pass Dhikkolee, a clearing in the jungle, where a Buniya, a Teekadar and his guard, with one or two cultivators, are established. The road keeps the high forest land on the west side of the Kosilla, but at this season passengers prefer the shorter route along the stony bed of the river, which finally quits the outer ranges at Goolur-ghat, whence a large *kool* or cut, is sent down to Chilkiya. The made road, here very rough and stony, descends into the Plains by the Amdanda Pass, and then reaches Chilkiya after about 4 miles of flat ground, covered with bamboo, byr, (*Zizyphus rugosa* and *Z. jujuba*.) and tall grass jungle. It is now a populous, straggling place, larger than Huldwanee or Kaleedhoongee, and abounding in the various productions of the mountains and the Bhabur, either iron from the Khetsaree and other mines, or vegetable dyes : the Myrobolans, Kaephul, and Pomegranate rind ? The Bhotiyas too, whom no consideration would formerly tempt to quit the mountains, now find their account in descending as far as Chilkiya, and the other marts with their Borax, Nirbysee, Doloo, or Rhubarb, Kutkee, or Picrorhiza and the leaves and stems of a small Tibetan Allium, “Jibboo,” &c. for which they take back chiefly sugar and sweetmeets : sheep and goats being their only beasts of burden.

Chilkiya is 1163 feet above Calcutta, and has no water but from the artificial cut before mentioned. The mountain views of the Gagur, the Kath ke Nao, and the Lower range of Gurhwal, are exceedingly beautiful.

In the forest to-day the *Diospyrus tomentosa* was large and abundant : it is called “Tyndoo,” and its timber is sold at Chilkiya as *Ubnoos* or ebony : the fruit is edible. With it grows the *Grewia sclerophylla*, “Phursia,” a shrub which also produces a large and edible fruit, the “Goorbhelee” of the N. W. In the warm shaded ravines of the lower

range, *Biophytum Sensitivum* is common, as is *Didymocarpus pedicellatus*, *macrophylla* of Royle, in the Dhikkolee, as well as in the Bumouree, and Burm Deo Passes. It is well known in Kumaon as the "Putthur-loung" or Rock clove, from the strong aroma of its dormant winter leaves, which are prescribed in cases of diarrhoea. To-day also occurred the *Gynaion vestitum*, "Peen," probably the *Cordia incana* of Royle. It is not uncommon in dry stony ground all over the Bhabur, and ascends the mountains to 2,500 or 3000 feet; the wood is much valued for mill-work, wheels, &c. The name, denoting *fatness*, is derived from the copious viscous juice of the bark and fruit: as the *Cordia myxa* had its Hindoostanee name *Lusora* from "lus," viscum.

Crotalaria sericea, and *C. salicifolia*, are common plants in the Chilkiya jungles—with *Indigofera hirsuta*.

December 19.—From Chilkiya to Bundurjoora, called 5 coss, due east: about half of which may be clearings; the rest, grass, jungle, and forest. The road admits the passage of hackeries, and there is just now a considerable number on it, with many passengers from Kaleedhoongee to Chilkiya. At $1\frac{1}{2}$ mile cross the Kosilla, here divided by a large island, its bed is formed of gravel and small stones. In another mile pass Burwa, a clearing on the Dubka, flowing now in two pretty large streams: thence through forest to Gybwa, a large clearing, north of which is an extensive plateau of elevated land and hills, covered with jungle, and isolated from the lower range; it much resembles the broken and rugged tract of Shah Munsoor near Kheree, on the Dehra road, so well known to tiger-parties. Beyond Gybwa is Patapane, and then Bundurjoora clearing, where I encamped by the Police station. These clearings all bear marks of recent and extensive enlargement: many large trees, partially burned or lopped, stand up in the cornfields, and remind one of the "elegant improvements" of Canada and the States. To this increase of cultivation in the Turaee is partly to be attributed the quantity of once tilled, but now abandoned ground, which we perceive in the mountains.

Bundurjoora Chokey is about a mile from the base of the low range of the Kotah Dhoon. In the S. W. face of this, about $1\frac{1}{2}$ mile distant there is a copious formation of vesicular calcareous tuffa or travertine, forming a cliff above 100 feet in height, and most likely constituting the mass of the range, which it does on the Kumola Pass, about 5 miles

East, where the summit, far beyond the reach of running water, is floored with it; the Kurra, a torrent rising in the Pass, encrusts every thing with lime to the distance of three miles from the hills, and probably much farther. The rock at Bundurjoola is quarried to a great extent and carried down to the plains on hackeries, each paying a toll of six annas per load, the owner providing his own workmen and tools. The tuffa contains numerous impressions of leaves and twigs; but the people affirm that they never come on bones of any kind.

From the crest of the cliff the view over the silent, illimitable forest, is impressive; a vast expanse of life, the happy medium, as some one calls it, between the restlessness and misery of thought and its negation in inorganic matter. To one also, long accustomed to the panorama of mountains which surrounds Almorah, the contrast of the plains of Rohilkhund, levelled (apparently) like a billiard table, is very striking, and perhaps conveys a higher idea of skill than the other does of power, in so far as the regularity of the one surpasses the wild confusion of the other: one, the result of the action of water, the other probably of fire and steam, the three agents which formed our continents in the first instance, and the last of which is now supposed to be about to regenerate them, as if the man who travels 50 miles per hour, though he be a more wealthy, must necessarily be wiser or better than he who jogs on at the rate of 5, and has time to look in and about him.

However silent these forests appear, they are by no means untenanted: even at the quarries the people are afraid to move a few hundred yards after sun set, on account of the tigers: while the Police stations are the outward and visible signs of the serious depredations which within a few years the bold outlaws of Rohilkhund were wont to commit on the settlers and farmers of the wilderness.

December 20.—To Kaleedhoongee, 10 miles, of which five, to Kumola, are wholly through forest. There is a large clearing, and its usual concomitant, the Goth, at Kumola, watered by cuts from the Kurra, a stream from the Kumola Pass, about 2 miles distant; a tolerable road goes over this to Putulia, in the Kotah Dhoon, opening a hackery route into the sal forest, which here supplies very large timber. The preservation of the Kumaon Forests, still more difficult than those of the Gurhwal, from their position, as often outside as inside the hill barrier, and therefore exposed to the havoc of innumerable smugglers,

is about to be secured by the politic enactment of exacting one rupee for every tree felled, which will save the young timber, and induce the merchants to search for the largest and oldest trees. The elephants conspire with man in damaging the woods: whole clumps of Bamboo, roots and stems, equally overturned by them, are met everywhere.

The ascent of the Kumola Ghat is gradual, and the summit level, with very gentle fall towards the Kotah Dhoo: all is completely clothed with forest. Towards the summit, we find *Bassia butyracea*, *Elæagnus conferta*, "Mijhoula;" two species of *Citrus*, probably *Limonum* and *Medica*, "Jameer," and "Bijoura," (the last also in abundance along the Surjoo under Gungolee,); and abundance of *Piper longum*, called "Pippula-mor," an article of considerable value as an export. There is also a species of *Embelia* with fruit in umbels; and a handsome shrub, *Tetranthera fruticosa*, or *apetala*, which also grows at Poonagiri, below Gungolee, &c., and is sometimes known as the "Gur-bijour," or wild citron, and Myda or "Meda-lukree;" but the tree particularly so designated, pointed out to me near Ramesur, appeared to be *Laurus villosa*, Roxb. and its Hill name *Kupooa Kouwul*. At the mouth of the Pass, *Rubus distans* and *Calamus Rotang*,* "Bet," are found.

The construction and nature of the Goth demand a few words. The term is corrupted from "goshth," a station for herdsmen or cattle, and in the mountains denotes the ground-floor of the house, devoted to cattle, as distinguished from *panda*, the upper storey, occupied by the family. In the Bhabur, where the arrangements are temporary, and only calculated for the winter, ranges of from ten to twenty rude sheds are placed side by side, formed of branches, and roughly thatched with grass and leaves. The depth is sometimes 150 or 200 feet, and any rain-water which might pour down through the re-entering angles of the general roof, is carried away by small gutters. The exterior walls are generally well fortified with brambles to repel the approach of wild beasts. The height is little more than enough to admit the cattle to stand; their owners occupy the inner end, which is partitioned off, and made snug with plaster, &c., for their abode. Here they luxuriate in boundless ghee, milk, and curds, selling the former in great quantities to dealers from the plains. It would seem to be a very prolific food; children of all sizes lie about as thick as the quails round the camp of

* *Calamus Roylei*, Griff.!

the Hebrews ; and many of them probably depart as suddenly ; at least the adult population of the mountains is by no means in proportion to the supply in these nurseries. Filth, exposure, and want of all medical aid, must destroy one half of them ; but, like the shrimps noticed by Paley, leaping on the sea sands, their brief existence is a merry one.

But the tenants of the Goth by no means trust solely to their cattle ; the neighbouring fields exhibit the finest crops of wheat, barley, and mustard, the produce of the latter alone sufficing, it is said, to pay the Government revenue. It is called "Dyn" or "Daen," and "Laec : " *Sinapis glauca* var. ? it is now in full bloom, reminding one of the western "Praiseagh buidhe ;" and will be ripe in February and March.*

These clearances are altogether dependent on artificial irrigation, and are only to be found where streams debouche from the mountains, or a few miles to either flank : in the intermediate localities, much of the ground is too poor and stony to repay the expense of cultivation, while already, the supply of water scarce equals the wants of the settlers, and

* Several species of *Sinapis* are cultivated in Kumaon for the oil, salad, or medicine they yield. But as Dr. Royle, very truly says, the genus requires careful revision : Roxburgh's descriptions, generally so accurate, are here imperfect, contradictory, or identical : and recal the reasons of Hudibras—

" His reasons fitted things so well,
That which was which he could not tell ;
But oftentimes mistook the one,
For the other, as great clerks have done,"

according to the best of my judgment.

"Rara" is *Sinapis glauca*, the "yellow Surson" of the plains, sent from the Sheharunpoor garden as "Bunga-surson ;" i. e. Bengal-surson. The natives of northern India always understand *this* when they speak of Surson : the branches being solitary, it is not *S. juncea*.

"Dyn ;" "Daen ;" "Laec." The commonest sp. in Kumaon ; seems to be the 'Toria' of northern India, which Dr. Royle identifies with *S. glauca*.

"Though not so tall and stout a plant as the Rara, it has much the same habit, and is equally glaucous. Its round petals, spreading siliques, and reddish brown seeds, induce me to think it may be Roxburgh's *Sinapis dichotoma* : otherwise he does not allude to this plant : but the stem is not dichotomous. It is either a variety of *S. glauca*, or a nearly allied species.

"Luhota," "Lyhta," cultivated in the Bhabur under this name, seems to be the "Jurria" of Almorah, and probably the Kalee Surson of Sheharunpoor, &c. : *Sinapis dichotoma*, according to Dr. Royle. The seeds are nearly black ; Roxburgh's are described light brown.

"Doowa." *Eruca sativa* ; cultivated in the Bhabur, and variously known as "Tara," "Sehooa," "Gohooa," from Oude northward. The stem is covered with reflexed hairs.

"Teera." *Raphanus raphanistrum* ? said to be cultivated about Benares.

is a subject of frequent dispute. If therefore, the whole Turæe be ever reclaimed, it will be by a judicious system of canals from the large rivers, supposing the levels to admit, and the water to be not demanded for the richer countries below.

The total area of cultivated acres in the Kumaoon Bhabur, Mr. Batten informs me, is 18,500

Which are assessed at rupees, 9000

Revenue from timber, bamboos, grazing, 18,700

From which it appears that the district is one of more interest to the naturalist than to the Government.

Each bullock brought to graze is charged by the farmers of the revenue, three annas per season : each buffalo, four. A cart for drawing timber pays twelve annas to one rupee per trip ; judging by the competition in this trade, it must be lucrative.

At Kumola the direction of the route to Kaleedhoongee changes from E. S. E. to East ; adjoining the cultivation of the latter is the extensive clearing, Nyagaon ; both watered by the Bor or Boula river, the bed of which, now an expanse of boulders and gravel, is crossed near Kaleedhoongee. Beautiful views of the Nynsee Tal group of mountains, rising tier above tier ; the Symdhar, a pine-covered range of 6800 feet, breaking off from Deoputa near Koorpaka, is here perceived to interpose between Cheenur and the lower mountains to the S. W. These last are completely enveloped in forest, much of which is Sal.

December 23.—From Kaleedhoongee to Huldwanee Munde, 15 or 16 miles, by a good hackery track. To Chousula, 5 miles, the soil is little else than gravel, supporting a thin and stunted forest, traversed by half a dozen dry channels of the Nihal, the westernmost of which passes a few hundred yards east of Kaleedhoongee. Chousula is a cleared tract close to the mountains, watered by the Bukra, a torrent from the Bilooa Khan mountain, the summit of which is visible, in the direction of Nynsee Tal. *Embelia robusta* and *Clerodendron siphonanthus* grow in the Chousula woods : though abundance of the first is to be had hereabouts ; the Almorah druggists sell the fruit of *Rottlera tinctoria* for it, as the true Bhaberung !

Leaving Chousula, the road, still skirting the mountains, passes the spacious clearings of Futtehpoor, with a very neat Police Chokey ; Peepul-pokhra, in the heart of a thick sal forest ; and Loogria sal, a

very large and apparently recent settlement, watered by Kools (parbutic *gools*) from the Gola river above Huldwanee, which is three miles on : the intervening land is almost all under cultivation, and Huldwanee itself is a very open, and compared with other marts of the Bhabur, a healthy locality. For several years it was the chief entrepot for Kumaon, but Kaleedhoongee will prove a formidable rival. It was founded by Mr. Traill in 1834, and has its name from the Huldoo trees (*Nauclera cordifolia*;) it consists of a quadrangular enclosure, perhaps 80 by 40 yards, the shops facing inwards, but forming a complete antithesis to the Royal Exchange; there is, however, a brisk traffic in cloth, blankets, salt, sugar, grain, groceries, &c. in exchange for the products of the mountains, the natives of which so manage as to arrive here on Tuesdays, when the market (penth) is held. Close on the east is the broad, stony bed of the Gola, Goula, or Gargee, the Kitcha of the Plains, a rapid and considerable river, draining the four mountain lakes, Nynee, Bheem, Noukoochia, and Mulooa Tals. To the N. E. in the second range of mountains, Loolan Putee, Dhyanee rao Perguuna, there is a sacred and very conspicuous cone, called Kylas and Muhadev ka Ling, the form of which is said to come very close to the original ling in Tibet : a fair is held on it in Phalagoon, just before the Holee. The East is not farther from the West, than the state of public feeling which glories in such a phrase as the above, is from our own. The French have an anecdote that in a diplomatic conference between Lord Castlereagh and Talleyrand, the former, with a terrible solecism in French grammar, remarked, 'Perhaps my life may be longer than your Excellency's;' to which the bishop drily replied—"Pent-être." It was nevertheless, by this standard that the superiority of Siva over Vishnoo was measured, for while the Vaishnavas boast the four great shrines of their lord, Ramisseram, Budureenath, Dwaraka, and Jugunnath, embracing the length and breadth of the land, they cannot deny that Vishnoo upwards, and Brahma downwards, in vain endeavoured to reach the limits of Mahadeo ka ling!

In the neighbourhood of the Kylas Cone there is a remarkable scar on the declivity of the Birond Mountain, reported to be 8000 feet high, and lying nearly due south of Almorah. Birond was one of the Great Trigonometrical Stations : but the Map of this district is hitherto unpublished.

Huldwanee, not Bumouree, is the best and usual encampment for troops : Bumouree is in fact altogether off the road to the N. W., and Kath Godam, 3 miles north, at the very foot of the mountains, though provided with a Buniya and a Bungalow, is extremely disagreeable from the boisterous winds that blow down the Pass.

Roodurpoor, about 20 miles S. of Huldwanee, rather a large and pretty place, is most unhealthy, from the prevalence of deep swamps and stagnant nullahs ; the forest reaches to within six miles of it ; the grass and swamps extend S. as far as Manpoor, nearly 30 miles from the mountains, being an excess of seven miles over the depth of the malarious belt on the Moradabad and Nynce Tal line, and an additional argument in favor of the last. About November the herds of cattle begin to assemble, and, as the grass is burnt, disperse over the Turaee, feeding on the sweet and nutritious shoots which in 10 to 15 days, spring from the ashes. Till this general conflagration, such is the height and thickness of the various Arundines, Sacchara, and other rank grasses, many of them sufficiently tall to conceal an elephant and its rider, that this region is impenetrable. In autumn their innumerable waving white plumes convert the prairies into boundless "seas of milk," if indeed the Indian expression was not rather derived, as an ingenious friend suggests, from the seas of white clouds feeling up all the vallies, and seen from some "heaven kissing hill" of the Himalaya. My visit to the Bhabur was at an unfavourable season for identifying the Gramineæ, but the following seemed the most conspicuous.

Saccharum spontaneum : "Kas," "Jusha," "Jhansh."

Saccharum semidecumbens : "Tat." "Neja," its grass, "Mora." The culms are used for screens, and supply Kumaon with pens. It is the "Kilik" of the Plains, Oude, &c. from "Kil," to be white.

Saccharum Munja : "Moonj." The blade beaten and twisted, makes a strong rope : the culm is "Sirkee."

Saccharum sara and exaltatum : "Surhur," "Suroor."

Arundo karka : "Nul:" "Nul-toora:" to 5000 feet.

Arundo? ——— "Khyla:" "Khylooa:" said to intoxicate and even poison cattle fed on it : to 3500 feet in the mountains.

Anthistiria arundinacea : "Oolloo," "Kunyoor," "Kundoora:" to 3000 feet.

Andropogon muricatus : "Gandur"—the roots "Khus"—the culm "Seenk."

Andropogon (Sorghum) halepensis: "Buroo," "Burai: "Rikhonda;" to 3000 feet.

Imperata cylindrica: "Shiro."

Andropogon Iwaruncusa, (i. e. *elephant* or *best* Koos, from *ibh* :) "Myria," "Gangulee," "Cheretta." "Dab," "Peeria." The last is properly the *Cymbopogon* so abundant in the mountains, with roots smelling and tasting of lemon and ginger. *A. Iwaruncusa* grows along the Surjoo nearly (perhaps fully) as far as Bagesur, and as high as 3500 feet.

Typha elephantina: "Pudera," "Petara." This penetrates the mountains a long way by the course of the Kalee: the leaves are much used in the manufacture of soft mats.

About Huldwanee, *Martynia diandra* is completely naturalized: the following trees, &c. are common.

Ulmus integrifolia: "Kunjoo:" the trunk is generally covered with an orchid, probably *Vanda cristata*, or *Cymbidium tessellatum*. *Cymbidium triste*, *Oberonia Iridifolia*, *Pholidota articulata*, &c. abound here, and on the outer mountains.

Leonotis nepetæfolia: "Gooma."

Pogostemon plectranthoides: "Roodra," "Roodla," up to Almorah.

Lantana dubia: up to 2500 or 3000 feet.

Sponia ——— "Khusuroa." Its glossy, but extremely scabrous leaves, are used to polish wood: probably the "Khaksi" of Kirkpatrick's Nepal.

Solanum verbascifolium: "Usheta:" the pounded leaves are used to expel leeches from the nostrils of cattle; the Reetha or soap-nut is similarly employed.

Solanum diffusum.

Solanum Jacquini: "Kunth-karee."

Solanum rubrum: "Chhota-gheewaen." The berries of this nightshade are eaten with impunity by the mountaneers.

Bauhinia purpurea? *B. parviflora*, and *B. Vahlia (racemosa)*.

Cassia Tora, *C. purpurea*, *C. absus*: "Bunar."

Butea frondosa: "Dhak."

Desmodium gyrans.

Dicerma pulchellum.

Tephrosia purpurea.

Cæsalpinia bonducella : "Kuronj." The fever-nut : probably introduced.

Clerodendron infortunatum : "Bhutt."

Clerodendron ternifolia.

Casearia Cheela : "Cheela," "Cheelara."

Phyllanthus leucopyrus : "Ainta."

Spondias mangifera : "Umbara."

Wendlandia cinerea.

Gmelina arborea : "Goomhar."

Ficus Cunia : "Kewnia." To Roodurpoor.

Ficus oppositifolia : "Totmeela."

Leea aspera.

Artemisia indica : "Patee" : *A. elegans* (Roxb.) "Jhou."

The upper forests to the base of the mountains, are choked with endless briars : *Cæsalpinia sepiaria*, "Eira," the Mysore Thorn : *Acacia cæsia*, "Kutrar." *Acacia pennata* (Buchananiana ?), *Mimosa rubricaulis* : both called, "Agla :" the pitiless *Acacia catechu* : all, except the last reaching to about 4000 feet elevation in the mountains, where *Rosa Brunonii* is equally bad.

Plants common to the whole Bhabur, are—

Acacia elata : "Buro."

Acacia speciosa (Lebekh ?) "Tantia." "Kulsees."

Acacia Catechu : "Khyr."

Robinia macrophylla : "Gonjha," passim.

Dalbergia Sisu : "Seesoo," "Seesum."

Flemingia semialata : "Bhutia."

Mucuna pruritus : "Goncha."

Cassia fistula : "Kitola," "Itola." "Raj-brichh." This "king of the trees" flourishes to nearly 4000 feet elevation, and is, as Dr. Royle observes, even more brilliant than the Laburnum—the "Golden Rain" of the Germans. He has, however, fallen into a trifling oversight in stating (Illustrations : 184,) that it flowers in March : May and June are the months. The fruit is collected in large quantities and sold at the various mundees ; the "Umultas" of the Plains.

Abrus precatorius : "Ruktee," "Rutnulia."

Bombax malabaricum : "Semul." Flourishes to at least 4500 feet in

the mountains : the seed is eaten by the Buceros, called here "Hoong-zee-bagh."

Helicteres Isora : "Jonka-phul," "Muror-phul"

Abutilon Indicum.

Moringa pterygosperma : "Synjuna." "Horse-radish Tree."

Sesamum orientale : "Til," very abundant in the more open woods, and evidently wild.

Premna mucronata : "Ugnioon;" from the Sanscrit "ugnimuntha," "churning fire;" from the custom of procuring fire by friction of two pieces of its wood, about Almora. "Ugnioon" is applied to *Euonymus Hamiltonianus*.

Premna spinosa. Dr. Wilson gives "Urni" as one of the Sanscrit synonymes of this tree : but all over our Northern Provinces it is the well known name of *Clerodendron phlomoides*, corrupted in Goojjurat where it is abundant into "Irun" and "Arnee." A more careful examination of the popular names of plants would considerably diminish the now improbable number of Sanscrit terms applied to the same object. *Premna* and *Clerodendron* being of the same order are likely to have in common the property of ignition by friction.

Vitex negundo : "Mewree;" "Shiwalee." Further enquiry throws doubt over the probability of Shiwalee being the *Sephalica* (*Nyctanthes*), though in Bengal, the latter is called "Shioolee;" on the contrary, the Kumaon term, ("Sinwar" in Behar) appears to come from the S. "Sindhoovar" "choosing the water," a very apt designation for *Vitex*. The Chinese in Kumaon make a kind of tea from its leaves. *Vitex trifolia*, and *V. incisa* probably exist, but I have not discriminated them hitherto.

Emblica officinalis : "Aonla," "Amla;" up to about 4000 feet. Wilson gives the etymology, "clean, pure;" but since "uml," "aml," denote sour, acid, and this is pre-eminently so, these would seem to be the roots, as avowedly of "umlika," "amlika," the Tamarind. "Emblica," indeed appears to be the same as "Amlika."

Rottlera tinctoria : "Rooen." "Rolee."

Terminalia chebula : "Hur." "Hurura."

Terminalia Bellerica : "Byhura."

Pentaptera glabra : "Saj."

Lagerstroemia parviflora : "Dhoura," passim.

Grislea tomentosa : "Dhoula." To Almorah ; and 6000 feet.

Ehretia laevis : "Kodah," which, at Almorah, is *Cordia myxa*.

Tetranthera monopetala : "Kutmur." "Kukooree," "Kerowlee," "Putoya." Probably the Sanscrit Kutumbura.

Cordia latifolia : "Borla," "Byrala," "Bourala."

Randia dumetorum : "Munyool," "Mynphal."

Kydia calycina : "Puta."

Sterculia villosa : "Oodial."

Garuga pinnata : "Kitmira." The leaves are excellent fodder for cattle : hence "Khurput," "Grass-leaf," the name in Gurhwal.

Wrightea mollissima : "Doodhee."

Holarrhena pubescens, (or *antidysenterica*) : "Kooer," "Koor," "Kooda," *passim*.

Cucumis Hardwickii : "Air-aboo." In Kumaon, the term "In-drain" is appropriated to *Trichosanthes palmata*.

Lygodium semi-bipinnatum, and *L. japonicum* : two scandent ferns.

Azadirachta indica : "Neem," nowhere indigenous, but planted near the Goths and Mundees, the leaves being greatly valued by the mountaineers. The force of "azad-i-durukht" is "spreading tree : " more true of the Bukayun than of the Neem.

Cannabis sativa : "Goon-bhanga,"—the fertile plant, yields seed for oil, and *Gunja* : "Phool-bhanga" the male plant, fibre only : from this are made strong ropes, and the sackcloth, called "Bhungela : " "Kothla," "Bora" and "Gajee." The wild hemp, "Jungulee-bhanga" is of no use for fibre, and merely affords "Churrus." The word "Sun" seems never used to denote *Cannabis sativa*.

December 24th.—From Haldwanee to Bheemtal, about 14 miles. At three miles is the bungalow called Kath-godam, at the base of the mountains, and mouth of the Bumouree Pass, 1896 feet above Calcutta. It derives its name from the wooden Store-room erected here in days of yore for the commissariat : from which circumstance the "godam" has now in Kumaon become universal to express supplies of provisions. The place is now one of small resort, the violent blasts of wind which rush down the Pass during the night and morning being excessively cutting and disagreeable at this season ; about 1½ miles on the sandstone rock first occurs in situ at the short ascent called Hath-gya or guleeon, below which the Hill-porters formerly refused to carry their loads.

This sandstone, which forms the mountains up to Bheemtal, is exactly the same that we meet with between Bar and Subathoo: it is here beautifully stratified: the strata dip N. E. or from the Plains. A short but rather abrupt descent (the main difficulty in the carriage road to Nynee Tal,) leads from Hath-guleon into the hot and narrow, but pretty valley of Chouhan ka puta or pata, watered by the Goula, with a hamlet called Hath, and a Goth on the acclivities. A little higher up is the Mango-grove, "Ranee kee Bagh," where the Goula receives the Buliya from Nynee Tal to the N. W. A little below the point of junction, at a holy spot called Maeepoor, or Maiapoor, where a fair is held annually in January, is the Chitr-sila—"the mottled stone," a huge rounded boulder of quartz conglomerate, reposing on a deep cleft in the sandstone, which forms the right bank of the Goula. It is sacred to Devee and Mahadev, and is greatly venerated—no new thing under the sun, as may be seen in the book of Isaiah, c. lvii. The people of Kumaon always burn their dead at such a "sungum" or confluence. A house, entirely of gold, is believed to exist somewhere here, but invisible from enchantment. The Buliya is here crossed by an iron suspension bridge, a short ascent from which brings us to the stony and uncultivated dell called Umritpoor, on the Burokhuree or Bheemtal stream, which also joins the Goula close by. From Umritpoor is the way to Kylas mountain. From Kath-godam to this point the Pass is sometimes much infested by tigers, and so many are its intricacies, and such the luxuriance of the forest which overhangs the road, that their destruction is rare and accidental. About 25 persons were devoured or killed here this season; but so capricious are these brutes in their haunts, that not one casualty seems to have occurred in 1847. The Nynee Tal cluster of mountains is rather lumpy as seen up the Buliya, but the glen itself is most beautiful, the path to Nynee Tal keeping to its south side, deliciously shaded by the forest and the mountains.

There are several small Goths, where Turmeric, &c. is cultivated: Kushainee, Jeeolee, Dogaree, &c. standing for the most part on elevated gravel plateaux.

From the upper end of the Umritpoor dell the ascent is nearly continuous to Bheemtal, passing the Pukurbhura stream, and the Suriam and Tooshiara Panees, with springs and wells. In a profound glen to the right, the Burokhuree rattles along its shingly channel, passing

under a small village so called, which tradition has handed down as destined to be overwhelmed one day by the bursting of Bheemtal.

The scenery here is wild and beautiful : indeed the Bumouree Pass is glorious in the superb and varied outline of the mountains, and in the exuberant forest which every where clothes them ; frequently bound together into impenetrable thickets by the Acacias, Bauhinias, Robinias, Vines, Ivys, and other *lianas* which coil their boa-like stems round the trees. This richness of vegetation contrasts remarkably with the thinness and even bareness which prevail more or less on the same south aspect from 4500 or 5000 to 7000 feet. Nothing can exceed the force of the wind or the heat of the sun in the Bumouree Pass, and yet its forests are without a break. A phenomenon perhaps to be attributed to the dampness of the climate, which, at all seasons suffices to nourish very numerous orchideous epiphytes, and in the rainy season, when this range is drenched with perpetual showers, a profusion of Balsamina, Didymocarpus, Platystemma, Chirita, and other plants, half vapour, half zephyr, which become rare, or disappear beyond the Gagur. Thus in the Belkhet valley also, lying south of the Kanadeo range, answering to the Gagur, we find the north and south side of the exterior range a mass of luxuriant vegetation, while the north aspect, forming the southern flank of the second range, is comparatively denuded, till we approach the summit. Probably twice the quantity of water falls on the outer ranges, which must find its exit in more copious springs along the base of the mountains where the forests are thickest. It may be, also, that the zone of 5000 to 7000 feet, on the south face of the Gagur, and its continuation, is a sort of debateable land, too cold in winter for the products of the Turæe, and too warm in summer for those of the mountains, which last are found to flourish at the same or much lower level on the opposite and shaded side : where also, from the diminished evaporation, "the scent of water" is more abundant.

Either from the presence of this universal forest, and its associated fever, or that the mountaineers are attracted by the richer and more easily irrigated lands of the Bhabur, the S. W. border of Kumaon is very thinly inhabited and scarcely cultivated at all ; while the corresponding belt from Sirmour to the Ravee is densely peopled, and every where scarped into terrace-fields of corn, ginger, turmeric, &c. ; the last two being five or six times cheaper than in Kumaon.

Approaching Bheemtal, we first meet the *Bassia butyracea*, "Chioora," or Butter-tree, at Tooshiara Panee, at about 3500 feet elevation; it grows considerably lower down in the dell of the Buliya: its flowering time is Nov.-Dec. The vegetation above Tooshiara Panee begins to change rapidly, and at length a slight descent from an easy Pass, opens the Bheemtal, a pretty blue Lake, 3000 feet long by 2400 broad (Herbert) and 4445 feet above Calcutta. The road follows its eastern brink, and near the northern end, crosses the clear, rapid burn which carries off the superabundant waters into the Burokhuree and Goula. At this point stands an old temple of Mahadev, shaded by a very fine Toon tree and a little beyond is the bungalow. This, the N. E. side of the lake, is bounded by a range of low trap hills, on one of which, south of the bungalow, the Gorkhalees had a small stone fort, Chhukhata Gurhee, now dismantled. The name, which is that of the pergunna, is said to refer to its six Lakes. To the N. E. and N. W. the mountains rise 1000—1500 feet by easy slopes, and though deficient in the crags and forests of Nynee Tal, present scenery of a very pleasing, open description. To the north, Bheemtal communicates by a tract of flat, marshy, and partially cultivated land, with the Kooa or Surria Tal, which at present is merely a large pond: an exceedingly tortuous, but perfectly clear stream flows down from the Kooa Tal, and only wants a few willows to resemble the fens of Lincolnshire. A small bund at the temple would inundate all this tract to the envy of Nynee Tal: while on the contrary, a corresponding cutting of the actual barrier would fit it for excellent cultivation, after the heart of such utilitarians as Baillie Nicol Jarvie, who would have drained Loch Lomond itself. The measure might indeed be here expedient to gain land for the Tea Plantations; several of these, the Kooasar, the Bhurutpoor, the Russiah, already cover the fields and slopes hereabouts, as well as two miles eastward on the Noukoochia Tal: and however their flourishing condition, and sanguine prospects be admired, it is impossible to shut one's eyes and ears to the fact that the owners, or at least, the holders of the land, are most reluctant to surrender the inheritance of their fathers, though the Government compensation be on a liberal scale. There was even "a sough" that they intended to stone the superintendent and uproot the shrubs: but these were, at the worst angry words: and when the farms are made over to them, and a handsome price paid them

for the green leaves, they will probably change their minds on this matter.

Three to four miles west from Bheemtal across the ridge above the Kooa Tal, in a deep basin, lies the group of lakelets called "Sat Tal," generally of a circular form, and much resembling volcanic craters. The neighbouring hills are of trap, capped by slate. These lakelets discharge their waters into the Buliya; and are fed from a system of glens separated from that of Bheemtal by a low neck near Mahra village, north of the latter.

In the Bumouree Pass and upward, occur,
Argyrea strigosa (or *setosa*): to 3500 feet.

Coffea Bengalensis: "Kuth-jahee."

Holmskioldia sanguinea: "Koobtolia:" to Bheemtal. It is remarkable that the natives have no well-fixed name for this beautiful shrub, which is sometimes mistaken for the *Fuchsia*.

Boehmeria frutescens (or *tenacissima*): "Poee." Nets are made from the fibre, which is very tough.

Boehmeria macrophylla (or *macrostachya*): "Gurgela."

Boehmeria nervosa: "Getee." The wood is turned into bowls, &c.

Boehmeria salicifolia: "Tooshiaree."

Ruellia latebrosa.

Strobilanthes.

Panax fragrans: from 2000 feet up to Bheemtal.

Hedera parasitica: "Kot-semul:" from 2000 to 3500 feet.

Vitis latifolia: "Pun-luglee:" "Bhynsia-umlee."

Vitis lanata.

Cissus serrulata: occasionally an immense climber: from 2000 to 4000 feet.

Croton polyandrum.

Grewia didyma: "Bhimool."

Abutilon oxyphyllum (Edgeworth): near *A. polyandrum*, common here and the Kotah Pass at 3000 feet.

Cocculus cordifolius (or *verrucosus*): "Goorcha."

Pothos officinalis? "Huthunglia," "Guj-peepul." The leaves of the Kumaon plant are often deeply cut: hence the name: "hand and fingers."

Curculigo recurvata: "Petaree."

Kalanchoe varians: "Noonoo." "Bukul-puta."

And, generally, what have been already noted in the descent from Nynee Tal; but in the shady dell of the Buliya, between Jeeolee and Kushamee, we have *Wallichia* (*Harina*.) *oblongifolia*, Griffith; Ground Palm, "Kala-ounsa."

Sabia campanulata.

And a little lower, between Jeeolee and Dogaree, *Thunbergia coccinea* covers every tree and bush with its dark stems and leaves: it is in full bloom all the winter, with innumerable drooping racemes of intensely red blossoms.

Neither this nor the *Wallichia* Palms, are to be met from the Buliya to Dhikolee: the former is, therefore, in all probability,* their N. W. limit. Towards the Snowy Range Lieut. R. Strachey found the *Wallichia* on the Ramgunga, within 25 miles of the glaciers.

* At a time when the geographical distribution of Plants is a subject of interest, the following particulars of the Flora of Rajpootana may not be out of place here.

Cadaba indica: "Jethi-mudh." Palee in Marwar.

Niebuhria oblongifolia: "Chekul." Nusseerabad.

Cassia auriculata: "Awul." Nusseerabad. The bark much used in tanning.

Poinciana elata: "Sundura." Common by towns and villages in Marwar.

Crotolaria ramosissima: "Suntra." Jeypoor.

Acacia —————? "The Cypress Bubool." Nusseerabad and on towards Dehlee.

Amongst the Mairwara Hills about Beaur, S. W. of Ajmere, occur:—

Balsamodendron agallocha? "Googgul." The *Amyris commiphora* of Roxb.

Vogelia indica: "Chitrawul." "Chitra."

Toddalia aculeata: "Duhun." "Luhun."

Sarcostemma viminalis: "Dukhunc-tohur."

Balanites Ægyptiaca: "Heengo," "Hingota." Stiff clay land from Goojrat to Kurnal.

On the sands of Jeypoor and Shekhawutee:

Lithospermum vestitum: "Rutunjot."

Leptadenia spartium (or *Jacquemontiana*). "Kheep."

Ephedra —————: "Phok."

Orobanche Calotropidis, (Edgeworth.)

Prosopis spicigera: "Jhund"—covers extensive tracts in Shekhawutee.

Artemisia elegans? "Bunna." Ditto.

Peganum Harmala: "Isbund."

Berthelotia lanceolata: "Lesun," "Resun."

Kentrophyllum oxycanthum: "Poree."

Asphodelus clavatus: "Piazec." Whole fields with nothing else, between Umbala and Ferozpoor. } Ferozpoor.

At Bheemtal we enter on a new vegetable zone:—

Quercus incana: about a thousand feet lower than its limit in the Simlah mountains.

Castanea tribuloides: “Kutonj,” near the Hurria Binaik, above the lake.

Flacourtia sepiaria: “Kundye.”

Celastrus nutans: “Malkaknee.”

Celastrus spinosa: “Gwala-darim.”

Cocculus Roxburghianus: “Goorjial,” “Gurjial:” the “Peer-gruj” of Silhet. Enormous tubers.

Cissampelos convolvulacea: “Paree.”

Phyllanthus leucopyrus: “Ainta.”

Phyllanthus retusa: “Dhunee.”

Euphorbia pentagona: “Seehoond.” A favorite habitat of the beautiful *saccolabium guttatum*, which the Chinese say grows also in their country.

Cissus capreolata: “Punch-puta.”

Clematis Buchananiana and *velutina*: “Ghuntiali.”

Ranunculus lætus.

Ranunculus sceleratus: “Sheem.” “Jygunee-ainwa,” equally at home from Chouringhee to Arthur’s Seat.

Berberis asiatica: “Kilmora.” (*B. aristata* commences at 5000 feet, near Shamkhet.)

Prinsepia utilis: “Jhutela.”

Rosa Brunonii: “Kooja.” “Kweea,” “Kweeala.”

Rubus rotundifolia: “Heesaloo.”

Pyrus variolosa: “Mehul.”

Cratægus crenulata: “Geengaroo.” From 2500 to 7000 feet, but most luxuriant between 5000 and 6000.

Cerasus puddum (Royle.) *Prunus cerasoides* (Don’s *Prodromus*.) “Puya,” “Pudm.” A sacred (pavitra, pure) tree amongst the Hindoos; the name is from the S. “Pudmaksh,” “Eye of the Lotus,” in allusion to its pink blossoms, which appear in Oct.-Nov., and are soon succeeded by the leaves, which are of a glossy green, and in January, beset by myriads of aphides, which distil great quantities of honey-dew over them. This tree attains its perfection at Almorah, where it is the only evergreen, a very ornamental object amidst the prevailing sternness of

the scenery. The fruit ripens in spring: but it was completely destroyed by the snow of January and February 1847.

Viola Cæspitosa.

Impatiens balsamina: "Mujethee." A red dye is made from its leaves and flowers.

Jasminum dispersum: "Soormalee."

Medicago lupulina

Lathyrus. { *angulatus.*
 { *aphaca.*

} Common in the fields.

Androsace incisa.

Ervum hirsutum.

Ilex excelsa.

Tetranthera: "Kouwul." Several species.

Streptocaulon calophyllum: "Dal-bhengoola."

Chirita bifolia.

Æchmanthera tomentosa or *gossypina*: "Joundela." "Jhoola-boota." In profusion on all the hills around: especially towards Muloa Tal. In the low vallies between Cheennur and the Kotah Dhoon, it rises 10 to 12 feet high, a strong bush.

Porana racemosa.

Tragopogon elegans: "Gwalla." "Golshia." A pot-herb.

Bryonia laciniosa: *var.*

Zingiber chrysanthum? a sp. with habit of *Z. ligulatum*.

Salix tetrasperma: "Bhynsh." *Syzygium jambolana*, "Jamun," *Ilex excelsa*, &c. fringe the lake with Banj oak: the Lotus, *Nelumbium speciosum*, "Kouwul," or "Kunwul," grows in the lake, but still more abundantly in Noukoochia Tal: this, 4500 feet, being the highest level at which it seems to flourish. In the Lake are also to be found—

Potamogeton mucronatum, *crispum*, and ———.

Hydrilla verticillata.

Phragmites nepalensis: "Nul." "Tot-nul."

Scirpus lacustris? a great Bullrush.

Sagittaria sagittifolia.

Myriophyllum indicum,

and on the swampy brink towards the north end,

Altirnanthera nodiflora: "Bheemraj."

Veronica anagallis.

Ammania rotundifolia.

Plantago lanceolata.

Procris ——— “ Souchula,” used as a pot-herb.

Nasturtium officinale.

Drymaria cordata.

Acorus calamus : “ Buj.” “ Goor-buch.”

Coix gigantea.

Equisetum.

Adenostemma latifolia.

Epilobium (cylindricum ? Don.)

Mentha Royleana.

Hydrocotyle tenella.

Polygonum horridum : here only : abundant.

December 25.—From Bheemtal to Mulooa Tal, 8 or 9 miles East. Path rugged, gradually ascending an arid quartz mountain, of which the last ascent, at 3 miles, is composed of an exceedingly hard syenitic greenstone, of which Captain Herbert detected scattered fragments only near Bheemtal. He appears to have passed this district almost unaware of the predominance of this class of rocks. The brow of this mountain, known as the Ekwey Binaik, is from 5500 to 6000 feet above the sea ; it slopes south in a richly cultivated talus, to the Noukoochia Tal, a pretty tarn, embosomed in low rounded hills ; the outline broken into deep bays, originates the name, which signifies “ Nine-angled.” Its level (4368 feet) is somewhat below that of Bheemtal. Each lake sends forth its stream, which, meeting in the centre of the dale, form the Burokhuree. About the junction, there is an extensive formation of green and slate-coloured clay, called Komet, used in washing walls, &c. arguing perhaps the former extension and even union of the two lakes.

Fully 2000 feet below the Ekwey Pass to the East, flows the Goula, in its narrow and beautiful ravine : beyond this rises a lofty oak-covered spur of the Gagur, in the highest and remotest recesses of which are the sources of this river. The people call the spot the Champee ka gar, denoting probably the Satchoolia Group, East of the Gagur Pass : this latter also furnishes its tributary.

Descended S. E. over quartz rock, and amongst pine, oak, rhododendron, and a coppice of *Æchmanthera*, to the Goula, at Sukinjala

Goth, about a mile above the spot where it expands into the Mulooa Tal: it is a pretty large and perfectly clear stream, but is pushing a great bank of stones and gravel into the lake, which must ultimately be filled up, if not previously emptied by the bursting of the barrier at its lower extremity, which is said to be wearing down rapidly. The dimensions of the lake are about three-fourths of a mile from N. W. to S. E. by 200 to 300 yards across; the water clear, very deep and of a beautiful green, *Como* tint, derived perhaps from the reflected woods. Unlike the other Kumaon lakes, it is well stocked with large fish; a circumstance due to its inferior elevation, being only 3751 feet above Calcutta: this is accompanied by a sub-tropical vegetation, and the small villages in the neighbourhood, Kunialee at the upper, Shewa Kanulla at the lower end, are forsaken in the wet season, from the presence of *oul* or Turae fever. The lateral mountains fall so abruptly to the water, that much difficulty is experienced in getting round the lake. High above the exit of the Goula, on the N. E. mountain, is the immense scar, called the Mulooa ka Pyhra—"the landslip or rather rockslip of Mulooa," the fall of which, according to the tradition of the country, formed the lake by damming up the narrow glen: and certainly must have deepened it. The people preserve the usual legend, and even the name (Bhoor Koonda) of the village which was overwhelmed by the landslip; Mulooa, the owner of this village, shared its fate, and left his name to the Lake. His actual residence here being about as authentic as that of Pontius Pilate at the Alban Lake, we may rather search for the meaning of the term in "Mulla," "Malwa"—"high," which the tal is with reference to the Bhabur.

On the shingle at the upper end of Mulooa Tal, occurred a plant not yet quite in flower, which seemed to be Wallich's *Lobelia rosea*: 5 to 6 feet high: *L. pyramidalis* is to be seen in the glen of the Bukra below Nynee Tal: and in still greater abundance at 6500 feet on the Eastern face of Jagesur: it is exceedingly acrid.

December 26.—From Bheemtal over the Gagur Pass to Ramgar Bungalow, 12 miles north. The route keeps along the upper Basin of the Kooa Tal, and leaving Mahra village to the left, ascends to the head of the Shamkhet valley, 5700 feet above the sea (R. S.), remarkable as forming a depression of 3000 feet between the Eastern or Satchoolia, and the Western or Cheenur line of the Gagur, thus forming the lowest

passage from its south to its north face: it is drained by the Ninglat stream, which first flows West in the direction of the path to Nynee Tal, and then north to the Kossila: exactly the reverse of the course laid down in the Trigonometrical Map, where the engravers have drawn the Gagur continuously, and were therefore compelled to make their stream countermarch.

From the Shamkhet valley the Almorah road ascends gradually to "Jureepanee,"—the root or source of the water—(one of the feeders of the Goula), and then very steeply for 900 feet to the crest of the Gagur Pass, 7200 feet above Calcutta by the observations of Lt. R. Strachey, but 7768 according to Webb, which, though a probable misprint for 7168, is adopted by the geographers of Berlin, who mark the elevation 7314 Paris feet. Captain Herbert states it to be 7121. The mountain is densely wooded with Rhododendron, Andromeda, Benthania, Viburnum, Pinus longifolia, and fine Quercus incana and dilatata; but Bishop Heber was misinformed as to the Deodar, which does not grow here. His warrantry of the scenery renders description superfluous; yet it is by no means equal to what one commands from many other points, as any of the peaks above the new road from the Pass to Nynee Tal, or from the Peorah Bungalow. The traveller from the N. W. is struck by the nearness and boldness of the Himalaya—not a long curtain, but broken up into huge groups, masses, and pinnacles—the Punjchoola, the precipitious facades of Nunda Devee, and the colossal mass of Trisool, being right in front. The line between these and Budreenath is partially masked by the Chamee ka Dhoora, the Choor of Kumaon, a huge branch of the Trisool, attaining the elevation of about 13,500 feet. The nearer views comprize Binsur, Bhutkot, Doonagiri, Seyahee Devee, and the long blue, or in winter white, Doodootolee range, which fills the western horizon, and divides Kumaon from Gurhwal. To the south the prospect is limited: but by ascending the Western portal of the Pass, Bheemtal, with the exterior ranges, and a long expanse of plain and forest come into the field of view.

The Gagur Range has its appellation from one Gurg, who performed penance at the source of the Goula: those cool regions which are heaven to the Englishman, being hell to the Hindoo. Wilson explains Gurg to be "one of the ten principal moonies or saints, a son of Bráhma." Garggu means "descended from Gurg," and Gargee, the name of

the Saint's wife, is often applied to the Goula river. There is no decent proof, indeed, that any other wife ever existed, or that the Saint himself is not as imaginary a personage as his putative father. The Sanscrit root, gri, to sprinkle, to wet, seems to supply a more easy and natural derivation for the name, or "gurgur," making a gurgling noise; in allusion to the heavy rains which deluge the mountain and their result in innumerable streams. The Gagur is therefore the Indian Gargarus.

A pretty steep descent of 1300 feet down the north side of the mountains brings us to the Ramgar Bungalow, built on a plot of cultivated ground called Gujooteena, 5950 feet above Calcutta (R. S.) There is little space for the encampment of troops, but here, as at the other stages on this route, some shelter is provided in the way of substantial slated sheds, here called "Barracks," originally mule-sheds, which are available to passengers generally, and very useful in the cold and wet seasons. A Buniya is stationed at each Bungalow. Water, naturally scarce and distant, is brought down from the Pass to the Bungalow by wooden pipes. From its northern exposure, the climate here is colder than would be expected from the elevation. There is not much in the way of scenery; the bare, brown mountain of Lohakotee rising in front to perhaps 7500 feet, eclipses the snows: but to the S. E. the Sat-choolia or Sut-boonga, summits of the Eastern Gagur, are fine, not a little resembling Jukoo as seen from Elysium at Simlah, and (8450) nearly the same height.

From below Jureepanee to the crest of the Pass, and on the north side for 2200 feet down to the Ramgar valley, the Gagur Range is composed of syenitic greenstone, with occasional beds of clay and chlorite slate: at Jureepanee we also find masses of the identical syenite which has been erupted at the Binsur Muhadeo, and which Lt. R. Strachey informs me also forms the Surjoo base of that mountain. The Gagur syenitic greenstone extends eastward to the foot of Sat-choolia, and westward along the range traversed by the new road from the Pass towards Nynee Tal, which crosses the Ninglat stream at about 5500 feet, just where it enters the Shamket Gorge before mentioned: the flanks of this exhibit the greenstone much decomposed into rhomboidal fragments, finally merging, as at the Sat-choolia, into the quartzose rocks of Lurria Kanta. It thus forms perhaps the greatest formation of greenstone yet observed in the Himalaya.

The vegetation of the Gagur Pass is nearly identical with that of Nynee Tal: the following additions owe their existence most probably to an imperfect survey of the latter.

Astilbe rivularis.

Polygonatum multiflorum : Solomon's seal.

Leycesteria formosa : "Nulkurroo." "Sounjla."

Stauntonia latifolia and *angustifolia* : "Gopfla."

Millingtonia pungens : "Gurdar." "Khurus."

Staphylea Emodi.

Eurya acuminata : "Dewra." From 3000 (Kotah Pass) to 7500 feet.

Oxyramphis macrostyla.

Ulmus virgata : "Chumburmuya."

Paris polyphylla.

Sempervivum.

Sedum multicaule.

Polygonum Sinense.

Ophelia paniculata.

Aplotaxis canescens.

Calanthe plantaginea. Hyacinth Orchis.

Gymnogramme caudata : "Ooneena."

Michelia Kisopa : "Bun-chumpa;" a large tree flowering September, October: Dr. Wallich says April, May, in Nepal.

In the shady dell at Jureepanee we have the *Gyrandra laurina*? "Rukt-chundun," "Rutungulia," before alluded too; and here also the rocks and trees are covered with the beautiful *Clemates Nepalensis* D. C. *montana* of Don, flowering at mid-winter, each blossom with its involucre. Its range appears to be from 6000 to 7000 feet, growing by and in streams—apparently a rare plant, as I have only found it here and at Devi Dhoora. Dr. Royle mentions choor, wrukta, &c. 9000—10,000 feet as its site, and May as its flowering season—referring most probably to the *Clemates barbatella* of Mr. Edgeworth.

The western face of the Sat-choolia group, from about 6500 ft. is covered chiefly with Reeanjoak, *Quercus lanuginosa*, reaching up to about 8000 feet: where it is superseded by *Q. dilatata*, fringing the northern crests and declivities: associated with ash, holly, maple, *Symplocos, cratægifolia*, *Millingtonia dillenifolia*, *Kadsura grandiflora*, *Marsdenia mollis*, and the clambering *Xanthoxylon oxyphyllum*,

Sopobia parviflora is in abundance at from 7000—8000 feet, above Borakot.

Towards the lower limit of *Quercus lanuginosa*, in dense damp forest near Jilwa Deo, at the foot of Sat-choolia, I came unexpectedly on several low plants of the Thakil Palm, *Chamærops martiana* (vel Khas-yana), which I afterwards found of similar dimensions considerably north of this on the Bhatkot mountain. Should future search not bring taller specimens to light, the dwarf stature of these may be accepted as an indication that the tree attains hereabouts its western limit.

27th December.—To the Sat-choolia (or Sut-boonga)summits, a walk of three hours E. S. E. from the Ramgar Bungalow: the distance greatly exceeds the estimate, consequent on the suppression from below of several long and comparatively bad ridges. No guide being procurable, we went to work bull-dog fashion, descending to a branch of the Borakot stream, and then breasting an almost precipitous acclivity. A much easier way is to ascend a mile or more towards the Gagur Pass, and then strike off eastward, through beautiful forests to the col, east of the rural shrine Jilwa Deo, where at the termination of the greenstone, elevation 6800 feet, the routes meet. Hence to the summit, the ascent is somewhat difficult, the huge crags and cliffs of quartz rock, which constitutes all the upper portion of the mountain, offering considerable obstacles. The western summit, elevated 8450 feet (R. S.), or about 100 less than Cheenur, consists of a ridge level for a few hundred yards from north to south, but of no width: about half an hour's walk, east, and divided by a neck depressed 150 to 200 feet, is a more roomy summit, apparently of equal altitude, devoid of timber, and wholly overgrown with *Cherayuta* (*Ophelia cordata* and *purpurascens*); on this is a cairn and mast of the Trigonometrical survey.

There is no water on the western face of this group for the last 3000 feet: but it probably would be found at no great distance down the woody glen facing the north.—Marks of wild animals were abundant, hog, deer, &c.; several surrow, ghoorul, and kakur, showed themselves, as well as the foot prints and other vestiges of tigers, which roam all over Kumaon in the hot and rainy seasons: the mountaineers firmly believe them to be very regular in their devotions to Devee on the high places.

Choola and Chooda, or Choor, are identical terms, signifying 'head,' 'crest,' &c., from *chool* to elevate, and are distinct from *choolee*, a fire-

place; yet it seems to have been chiefly from this misapprehension, aided by an occasional riband-like wreath of cloud extracted from the snow by the sun, that the Punj-Choola has been reputed the seat of volcanic action. The only evidence of this hitherto known in the province, is that arising from the recurrence of frequent, but happily slight shocks of earthquakes.

Sat-choolia and Sat-boonga denote either the pure or the seven summits: they overlook an immense expanse of the Himalaya and of Hindoostan, and are composed exclusively of quartz rock, of which the strata dip to the N. E. and form tremendous precipices to the S. W., amongst which are the springs of the Goula. The range is continued round a deep bay to the N. E., in which direction is the Motesur or Motchur summit, also called Motee Pathur, 7782 feet, of which the rock is mica slate, the dip of the strata identical with that of Sat-choolia. The Mussooree and Landour rocks are all tilted up in the same direction here at Sat-choolia, as well as at Mussooree, this is probably due to the outbursts of trap rocks to the S. W. The parallel dip of the strata in the higher mountains noticed by Herbert and others, would appear to depend, in like manner, on the line of granitic eruption which, inside the Gagur, extends through Kumaon from N. W. to S. E. nearly; still higher up, but equally parallel, is the great range, in which the chief rivers have their sources; between these, running S. W. and even south, are the loftiest summits of the Himalaya, the highest of which, Nunda Devee, with its precipitous and apparently stratified front towards Almorah, seems built up on the same model as the lower ranges. The whole of the rocks of the main chain, however, can scarce be stratified: my friend Major Sampson, found the blocks brought down by the Vishnoogunga Glacier above Budreenath to be a normal grey granite. Moreover in the Jagesur range, near Almorah, which attains the elevation of 7721 feet, the rock (mica-slate) dips to the plains. In the case of the Bumouree ranges, where the sandstone strata rise steeply towards the plains, where not a vestige of any upheaving substance remains, but on the contrary, the land is exceedingly low, it is difficult to account for their position, except by the supposition that the subterranean force acted in a line with a very oblique inclination to the surface.

The descent from Sat-choolia may be varied from the ascent by

dipping down an exceedingly steep cloof on Borakot village, 3000 feet beneath; it has the disadvantage of a subsequent ascent of 1000 feet to the bungalow.

December 28th.—From Ramgar Bungalow to Peorah, 9 or 10 miles. The road dips 1000 feet to the level and rather open valley of the Ramgar stream, on the south or left bank of which was the original bungalow, a singularly unhappy position, exceedingly hot in summer, and, till warmed by the sun, as intolerably cold in winter. So cold are these vallies at night, that at Hawulbagh, only 4000 feet above the sea, and comparatively open, many plants are killed by frost, which escape at Almorah, 1500 feet higher.

A mile or so east of this, the road crosses to the north bank by an iron suspension Bridge (elevation 5050 ft. R. S.), 200 feet above which stands the village of Naikena or Ramgar, consisting of about 50 houses, as neat and correct in externals as the character of the inhabitants is, in our eyes, infamous. The place is the property and residence of a community of hereditary and, in their own estimation, high-caste Paturs, who keep up strong establishments at Almorah, Khilputee, &c. tending in no small degree to the demoralization of the province, and inflicting serious injury on the health and discipline of the troops in garrison. Nor are they content with Kumaon, for each cold season, this deplorable sisterhood detach some of their numbers to the various cities of Rohilkhund. The female children are all brought up in the profession of their mothers; the boys become *Naiks*, as the men of the village are called, who, in case of deficiency at home, get their wives from the iron-masters of Agur: no respectable family would think of an alliance with them: and Venus, as of old, marries with Vulcan.

From the bridge, there is rather a long ascent to what is called the Ramgar Gallery, when the road keeps for two miles the S. E. face of the hot and bare Lohakotee mountain, which rises fully a thousand feet higher: immediately beneath flows the Ramgar in a narrow and precipitous gorge formed by the Lohakotee and Sat-choolia mountains. Its head waters are in the deep recess formed by the latter and Motesur, on leaving which it irrigates the broad, undulating, and cultivated vale of Agur, possessed by a race who for ages back have worked the iron mines from which the Lohakotee mountain has its name. The old

mines are on the ascent above the village of Ramgur; those wrought at present lie more to the west, abreast of the bungalow. These men also work the iron-mines of Khetsari near Lohba in Gurhwal, whither they annually emigrate in November with their families and cattle. The mines on the Punar near Ramesur, and I believe those along the Ludheea, between Doorga Peepul and Deo Dhoora, are also in their hands. It is curious enough that Kirkpatrick calls the miners of Tam-bakan, a similar locality in Nepal "the Agrye caste or tribe." The name may be connected with the Agurwals of N. W. India, and it is certain that in the Aguri-kars, or artificers of Agur, Jacob Bryant would have infallibly discovered the remnant of the Egregori, the primeval instructors of savage man in metallurgy and husbandry.

About Ramgar village commences the Mica slate formation so general thence northward: on the Gallery, it is blended with strata of blue crystalline limestone, the whole dipping N. E. At the east end of the Gallery is the Deodara Pass, 6346 feet above Calcutta, on the neck which joins Motesur to Lohakotee. Here Almorah is first seen, backed by the snows, but the view is speedily lost, for the road now makes a second deep dip into the glen of the Deodar stream: this rises in Motesur, and flowing north, joins the Kosilla above Munrus. Its slopes exhibit a rich expanse of cornfields, with the villages Kilor, Banj, &c. a cheerful contrast with the gloomy woods of the Gagur. Tradition has it that valuable treasures are buried where the road crosses this brook: it is more certain that a wearisome acclivity must be breasted to the Laldana Binaik, about 6000 feet high; this pass was formerly guarded by a petty stone gurhee to the left, but is just now entrusted to the protection of the Deotahs, whose good will is secured by a number of paltry shrines, where the bushes are plentifully decorated with rags of every age and color. The ravages of tigers, since mitigated, led to this display of piety; but the animals still frequent Motesur mountain immediately above.

Peorah Bungalow, elevated 5800 feet (R. S.) is nearly a mile east of the Laldana Binaik, and 150 to 200 feet lower: being on the northern face of the mountain, it has little sun, and is a chilly spot in winter. About 5 miles distant to S. E. is the Motesur summit, 7782 feet, covered with *Quercus dilatata*, which shelters one or two low shrines of Muhadeo, Symdeo, &c. On the crags a little below are

certain marks which the people believe to be the footprints of elephants, horses, camels, &c., the army of a certain, or rather, uncertain god; who, wishing to pass this way, was resisted by the demon of the place: this latter obtained "moksh," emancipation from existence, by being quoited down amongst the Aguris: and hence they say comes Motesur or Mooktesur. The Motia Patthur is said to be distinct, lying between this and Devee Dhoora.

The vegetation about the Ramgur valley consists of *Craniotome versicolor*.

Pupalia sequax.

Rubia cordifolia.

Marsdenia Roylei.

Jasminum dispersum.

Mimosa rubicaulis (its upper limit.)

Bryonia scabrella.

The coppice about Peorah exhibits the usual shrubs, with *Spiræa cuneifolia*.

Rhus semialata: "Dukmeela."

Rhus vernicifera: "Goor-bhuliu."

Rhus parviflora: "Runnel," (Highest limit.)

Benthamia fragifera: "Bumoura."

Elæagnus arborea: "Gheewæe."

Myrica sapida: "Kæphul."

Cotoneaster affinis: "Rous."

Alstonia lucida: "Doodhee."

Quercus annulata: "Phuliant," "Funiyat." Upper limit 6000 ft. lower 2000.

Pardanthus Sinensis: to 7700 feet on Motesur.

Hedychium villosum.

Hedychium tenuiflorum? Between Ramgar and the Gallery, flowering in August, and discovered here by Moonshee Murdan Alee* of the Sheharunpoor Botanic Garden.

* This very intelligent and respectable Syyud, the first of his race, perhaps, who addicted himself to Natural History or any useful knowledge, and in whose honor Dr. Royle established the genus *Murdannia*, has, under the occasional instruction of Messrs. Royle, Falconer, and Edgeworth, his masters and mine, attained a considerable proficiency in Botany, and has compiled a Hindoostanee work on the subject, containing a

The warm exposure of the Ramgur Gallery exhibits the following plants :—

Amphiraphis cuspidata.

Osyris nepalensis : “Bukurdhura.” “Bukurja.”

Hypericum cernuum : “Ulooa-bena.”

Thalictrum rupestre.

Leea aspera : “Koomalee.”

Glochidion bifaria : “Mowee,” “Byr-mowee.” “Bukulwa.”

Cedrela serrata : “Dul,” “Dula.”

Vitis rugosa : “Assoujia.” “Puhur-phoota.” The first referring to the season, Sept.-Oct., when the grapes ripen, which are edible ; the second means “mountain-splitter,” from the habitat of the plant. It is also common on the crags of Motesur, Bandunee Devee, Binsur ; and is the same which in J. A. S. March 1847, p. 242, is termed *V. macrophylla*. But there is no need for a new name ; it is well-described by Dr. Wallich in the *Flora Indica*, with this exception that (in Kumaon at least), it does not inhabit “mountain and other forests,” but open warm crags. Wight and Arnott (*Prodromus* 131), and Royle (*Illustrations*, 145), identify it with *V. lanata*, Roxb. The two plants, however, are perfectly distinct, and never confounded by the people here. *V. lanata*, “Poorain,” celebrated amongst them for the abundance of sap yielded by its stock in spring (as *V. latifolia* and *rosea* are in the Bhabur) chiefly affects the warm vallies, from 4000 to 5000 feet, flourishing by the streams, and climbing over high trees. It flowers in May, with pale yellow petals, cohering at the apex, and in that form, heaved off by the stamens.

V. rugosa, on the contrary, prefers the most exposed crags, over and amongst which it creeps but never climbs, at from 5000 to 6500 feet or more, where *V. lanata* becomes rare. The stems rarely exceed six feet in length, and, as Wallich observes, the leaves rival in size those of the common Burdock or the Rhubarb. The flowers do not appear till

general introduction to the study, followed by a detail of the orders and genera, after the *Natural System*, comprising most of those indigenous to the upper provinces of India and the Himalaya. The work still languishes in MS. the expenses of printing being beyond the author's means. With some previous supervision, it is deserving the attention and patronage of the Asiatic or any other Society interested in the progress of Botany in India, amongst the Indians.

July, the colour deep red, the petals spreading, distinct; and scarcely to be distinguished from those of *V. tomentosa*, "Chuppertain," a resemblance noted in the Prodrum. The three species may be compared growing in company on the Ramgar Gallery, though *V. lanata* and *tomentosa* are rather rare in this locality.

It is an agreeable task thus to vindicate the fair fame of one whom it has recently been the fashion in Bengal to depreciate with a perseverance which would be amusing were it not malicious and dictated by personal hostility. The Doctor gives a description; it is rejected: he gives none; and is held up to our admiration with a "sine character!!!" Truly may he exclaim, we have piped unto you, and ye have not danced, &c.

In the vicinity of Peorah, and generally over similar ground in Kumaon, two forms occur, the tender fronds of which are commonly eaten, and are sometimes brought to market. One, "Kootra" is the *Nephrodium eriocarpum*; the other "Lingra," "Lioongra," "Leeoor," (a very difficult sound) is the *Asplenium polymorphium*; the first coming unto season in spring, the second in autumn.

Cinnamomum albiflorum: "Dalcheenee," "Kikra," is a common plant in the valley of the Koomnia below Peorah.

December 29th.—To Almorah, 9 or 10 miles. There is a long descent of about 1800 feet to the Koomnia river, which is passed by the Synj Iron suspension Bridge; then a rise of perhaps 1000 to the Dheeakot Binaik, on the spur from Roulakot, a bluff point connected with Bandunee Devee, and about 400 feet lower:—then a second-descent to the Suwal (Salmulee or Semul) river, which is crossed by the "Lat" Iron Suspension Bridge: and lastly, a tedious, rocky, very bare, and in Summer exceedingly hot ascent of 1600 feet to Almorah, by no means calculated to impress the visiter very favorably in the first instance. The rocks are quartz, mica slate, (with freestone beds in the Huree Doongree,) gneiss, and finally granite, which forms an entire mountain S. W. of the station, and has apparently lifted up, and in some places, contorted the others to a remarkable degree: to the south, indeed, the strata appear to dip under the granite: they also contain in this neighbourhood the quartz dykes supposed to indicate the action of granite. The quarries of micaceous and quartzose rocks supply excellent materials for building and roofing.

Approaching Almorah in this direction during the hot season, multitudes of large lizards may be observed basking on the rocks, conspicuous by their cobalt-blue legs, and the sure index of a broiling temperature: indeed, in the low vallies, where they rival the Gosamp in size, the climate in May and June differs little from the fabled one of the Salamander. These reptiles are generally considered to be insectivorous; here, however, they also devour grass and other herbs with avidity, and are very destructive in the gardens.

The town of Almorah in Purgunna Baramundil has already received its meed of description from Bishop Heber and Mr. Batten, to which I will only add one or two remarks on the animals, &c. of the vicinity. Mr. Hodgson, I think, tells us that the Jackal (here called Shial), seldom or never appears in the Himalaya; this is by no means true of Almorah, towards which they may be seen stealing every afternoon to pay their attentions to the poultry-yards, and goats; the handsome hill fox, "chooria-shial," is also not uncommon, and though Captain Thomas asserts the reverse, is, or at least was to be seen about Simlah. I observe also that Mr. Ogilby, in Royle's Illustrations, concludes that the domestic Ass has not been introduced into any part of these mountains; they are in common use as beasts of burden at Kanum and Soongnum in upper Kunawur. Leopards are numerous at Almorah, and levy heavy contributions on the flocks, the dogs, and the poultry; bears only approach during the autumnal harvest: tigers are never now known to come within ten miles of us. The Hare, Susoo, is not very common. Snakes and scorpions are common, some of the former above 6 feet in length, but generally harmless, though much dreaded by the people; in two years' residence I have never heard of an accident; but at Hawulbagh the Cobra is well known. A plant, "Guroor-bootee" is considered a cure for the bite: what was pointed out is *Barleria ciliata*.

Amongst birds, the common Plover or Peewit of the plains, *Vanellus Goensis*, is frequently to be seen; the people know it by the name Tishta; and, in common with their low-land neighbours, have the odd idea that it sleeps on its back with its legs upwards to prevent the sky from falling on it. No easy matter, with so watchful a bird, to bring to the test of actual observation, and hence perhaps the origin of the belief.

The highest point of Almorah, Fort Moira, is about 5577 feet above Calcutta; the general level of the ridge being from 50 to 100 feet lower. This elevation ensures a temperature sufficiently high in summer and autumn to induce the visits of the Firefly, the Cardinal, Rocket, and Mango birds, the Hoopoo, the Myna, flights of a beautiful Perroquet, the king of the crows, Bulbul, Shrike, the loud-wailing "Neoula," and other denizens of the plains, who here meet the Goldfinch, Skylark, Cuckoo, Black-bird, Field-fare, Jays, Tomtits, and Wagtails of several species, the pretty *Certhia himalensis* or Wall-creeper, the Woodcock (*Simkookra*), and other natives of the north; the whole kept in order and number by a very strong force of ravens, owls, hawks, falcons, kites, eagles, (a fine black eagle,) vultures, and demi-vultures.*

The phenomena of the vegetable kingdom are analogous, (though in part due to the agency of man,) denoting a middle term, where many tropical plants will not live or flower, from the cold, while the alpine ones either perish, or refuse to flower, from the heat. The climate seems very congenial to many of those from the more temperate regions of Central America. We have *Butea frondosa*, *Cordia myxa*, *Ficus religiosa*, *Grislea tomentosa*, *Sapindus acuminata*, *Lagerstroemia indica*, *Cedrela Tuna*, *Melia azadirach*, *Acacia Farnesiana*, *Cassia aurata*, *Michelia champaca*, *Yucca gloriosa*, *Ricinus communis*, *Musa sapientum*, *Eriobotrya japonica* (which, however, never matures its fruit), associated with *Populus ciliata*, *Pavia indica*, *Alnus obtusifolia*, *Juglans regia*, *Cedrus deodara*, *Cupressus torulosa*, *Pinus longifolia*, *Cerasus pudum*, *Pyrus variolosa* and *domestica*, *Cratægus crenulata*, *Armeniaca vulgaris*, *Clematis*, *Thymus*, and other northern forms.

Such data, fortified by experience, will enable us to rate at its proper worth the colonization cant which so often fills the gazettes, combined with the most exaggerated pictures of Himalayan resources, and the most chimerical schemes for railways, in a country where we are only

* *Gypaetos barbatus*, "Gidh," the common vulture, is a corruption of the Sanscrit *Gridhra*, which is our own word greed, greedy. Several of the birds enumerated are only to be seen here during the winter: the Cuckoo, "Hupooa" makes its appearance in the latter half of March: it is an interesting point, perhaps still undetermined, to detect the winter habitat of this bird: it would appear to be in the south. I have heard them as far down as Cawnpore.

The *Melia azedarach* (Betain of Almorah) agrees with the Bukayun of Meerutt, &c. the ridges of the nut being somewhat less prominent.

too happy to find any roads at all. In sober truth, the resources of the mountains are not many, and are already as much developed as the nature of the country will admit of. Consequent on the cost of transport, the timber, tar, iron, hemp, madder, &c., cannot at any remunerating price, come into competition with the water-borne articles of Europe, and other maritime lands; or the supply already equals the demand. The soil, except in the low vallies where the European colonist cannot exist, is generally poor, besides being pre-occupied, and often exhausted, by the aboriginal population. Of the feelings with which these would regard any extensive immigration of agricultural Europeans, we may judge by the dissatisfaction with which they relinquished the comparatively trifling lands required for the Tea plantations. The fine tracts of rich meadow, which flank the Snowy Range, are too remote for settlers, and are too high and too cold to ripen grain.

Then as Russia has been termed a despotism tempered by assassination, so the Himalayan climate is a tropical one tempered by thunderstorms. It is certainly less salubrious than is commonly supposed, and seldom so cool as to admit of European out-door labour. Everywhere we encounter miserably diseased objects amongst the natives—much to be ascribed to filthy habits, no doubt:—and up to 5500 or 6000 feet, the amount of sickness amongst Europeans, though not of a serious description, is considerable, and of a nature which singularly indisposes and unfits the subject for occupation. Such, too, is the power of the sun at *all* elevations, from April till October, between 9 A. M. and 4 P. M. that Europeans can rarely with impunity brave its rays.* The mean annual temperature at 7500 feet elevation is nearly that of Lon-

* On this point, Professor Forbes furnishes us with some results very instructive to those who think that by escaping to the Himalaya, they also escape the Indian sun, (supplementary Report on Meteorology, in the Report of the British Association for 1840.)

“Saussure seems first to have thought of comparing directly the intensity of solar heat at the top and bottom of a mountain: * * * and, by experiments on the Cramont, to the south of Mont Blanc, he actually proved the increased intensity of the solar rays as we ascend, notwithstanding the diminution of temperature.” The Professor himself, by “comparative experiments at the top and bottom of a column of air 6500 feet high, of known density, temperature, and humidity, under the most unexceptionable circumstances in point of weather” found the loss of solar heat vertically traversing the atmosphere to amount, at the level of the sea, to 29 per cent.: “a near agreement with the 32 per cent. independently determined by the method of Bouguer and Lambert with the same

don ; but the fact that few of the trees indigenous at that altitude can stand an English winter, points to a signal difference of conditions in the distribution of Himalayan heat and moisture. Dr. Royle well observes, after the astronomers, that, in advancing north from the equator, the sun passes over 12° in the first month, 8° in the second, and only $3\frac{1}{2}^{\circ}$ in the third ; and that hence, from his longer presence there, and the greatly increased length of the day, the heat is more intense at the tropic than at the equator : at the latter, the sun is more or less vertical for about six days only ; at the latter for nearly two months. The distance of the Himalaya from the northern Tropic is not great ; and where we have a southern exposure, is more than compensated ; *there* indeed, the sun's rays strike vertically with intolerable power, augmenting in the ratio of our ascent, so that one is absolutely scorched while walking on a glacier. What a contrast also between the generally serene brilliant sky, and extremely dry atmosphere of the Himalaya during eight or nine months of the year, and the cloudy canopy which so generally rests over the British Islands ! The sun's arrival at the Tropic of Cancer is marked here by that of the rainy season, when the previously dry atmosphere is suddenly, and for three months, saturated with moisture, with a sun potent enough to knock down an ox, when he does show himself, which is not seldom. During this period, one is alternately baked and chilled half a dozen times during the twenty-four hours, and that not in the low confined vallies, but on perfectly open ridges such as Almorah, where it is, consequently, a matter of some difficulty to adjust one's clothing to the frequent fluctuations of temperature, the annual change of dress which Mr. Fortune describes amongst the Chinese being here diurnal. The result at Almorah, Kussowlee, &c., appears to be as much, though not so dangerous sickness as in the

instrument (actinometer) at the same time : " again : " estimating the loss of radiant heat by a vertical passage through the atmosphere at only 25 per cent. ; at an angle of elevation of 25° , the force of the solar rays would be reduced to a half, and at 5° to one twentieth part," from the varying thickness and transparency of the atmosphere. Hence the necessity for shelter except in the morning and afternoon.

" The increased intensity of the sun's rays at great elevations supplies the probable reason (suggested to me by Lt. R. Strachey) of a phenomenon noted on a former occasion, viz. that the seeds of the same species of plant ripen much earlier on the lofty passes of the Himalaya than at their base.

much abused plains, the misfortune of which is that one cannot breathe there.*

If the above be a true view of the case, it appears chimerical to hope that the Himalaya can ever maintain an independent body of colonists, such as might supersede the necessity of drawing recruits from Europe, or such as, on any emergency, could be brought down to act in the defence of the Lower Empire. This is a very different question from that of the fitness of the mountains for sanatory settlements occupied by those in the service of Government, and whose means of subsistence are drawn from the Plains: that, indeed, is no longer a question: a hundred applications for every vacant appointment in the mountains attest the "deep damnation" of a life in Hindoostan.

The following list includes most of the plants found at Almorah and Hawulbagh, from 4000 to 5500 feet above the sea.

Anemone vitifolia.

Clematis grata: "Ghurmalee."

Clematis velutina: "Ghuntiali."

Clematis Buchananiana: —— rare.

Ranunculus lætus: "Dhynia."

Ranunculus sceleratus: "Sheem," (any marsh plant.)

The Sooruj-jal, or "water-sun" of northern India.

Ranunculus arvensis: "Ainwa."

Delphinium Ajacis, naturalized.

Delphinium pauciflorum: "Moonila." The root, chewed on Sunday, is a popular remedy for tooth-ache.

Thalictrum foliolosum: "Pengla-juree," "Chulnia."

Papaver glabrum, (Royle;) Cornfields: "Tukoovia," often perfectly glabrous, but sometimes stem, peduncle and calyx are extremely hairy.

Argemone mexicana: "Kuntela," rare.

Fumaria vaillantii: "Khyrooa," considered to be injurious to cattle.

Corydalis paniculata: (N. S. Edgeworth) at 3700 feet, about Binsur Temples.

* Having lately adventured some observations on the tidal currents of the atmosphere in these mountains, and endeavoured to show why the day-stream is from the Plains, and why the nocturnal one *should* be the reverse, I may here add that subsequent observation, during the hot season, proves the early morning breeze to be almost invariably from the East, or within a few points of it: but of a force much inferior to the other, which reaches us up the gully of the Kosilla.

- Kadsura propinqua* : "Sindrain."
Jasminum dispernum : "Soormalee."
Jasminum grandiflorum : "Jahee." "Chumbelee."
Fœniculum panmorium : "Sonp," "Sonf," "Fennel." Cultivated.
Bupleurum.
Hydrocotyle tenella, (Don.)
Coriandrum sativum ; "Dhuniya." Cultivated.
Heracleum.
Œnanthe ?
Anethum sowa ; "Soa." Cultivated.
Ptychotis ? *Pimpinella* : "Dhunjuree." Edible root.
Hedera helix : "Banda." "Ivy." From 2500 to 9000 feet.
Berberis asiatica : "Kilmora," passim.
Ampelopsis himalayana ; "Chuppurtung."
Vitis parvifolia : "Berain."
Vitis lanata : "Poorain."
Vitis tomentosa : "Chuppurtain."
Vitis rugosa : "Assoujia." On Bandunee Devec.
Leea aspera : "Koomalee," "Koormalee."
Cissus capreolata.
Olax nana.
Pittosporum eriocarpum : rare.
Epilobium læve and *cylindricum* ? Don.
Circæa intermedia : (7000—8000 feet, Binsur.)
Œnothera nocturna, *longiflora* and *rosea* : naturalized.
Poivrea Roxburghii.
Combretum nanum : "Phursia."
Osbeckia stellata : "Kookur-makree."
Osbeckia angustifolia.
Punica granatum ; "Darim." The rind of the fruit "Kooshiala."
 "Nashpal."
Deutzia staminea : "Moonetee."
Viscum album (*stellatum*, Don.) "Banda."
Trichosanthes palmata : Indrain."
Bryonia umbellata : "Gwala-kakree."
Bryonia scabrella, and *Nepalensis* ?
Begonia picta.

Lepidium sativum : "Halim." Cress. Cultivated.

Nasturtium officinale : "Peeria halim." Water-cress.

Alyssum maritimum : naturalized.

Sisymbrium sophia.

Arabis Thaliana.

Thlaspi arvense.

} "Jona-ghas."
} Abundant in the cornfields.
} "Dhupreea,"

Arabis longisiliqua : N. S. Edgeworth, on walls, &c. 4000 to 6000 feet. "Rai-ghas."

Capsella bursa-pastoris : passim.

Cardamine impatiens : "Shelia." "Shevia." Passim.

Raphanus sativus : "Moollee." Cultivated.

Viola cæspitosa and *aspera* : (*canescens*, Wall.) The first down to 2000, the last to 3000 feet.

Drosera lunata : "Mukhajalee." Sundew. 4000—8000 feet.

Passiflora foetida (or *cærulea* ?) "Sunkhya." Naturalized.

Hypericum cernuum : "Ulooabena."

Hypericum uralum, *Nepalense*, *Japonicum*.

Polygala crotalaroidea, *elegans*, *glaucescens*.

Linum trigynum : "Peonra."

Linum usitatissimum : "Ulsee." Occasionally cultivated.

Bombax malabarica : "Semal."

Riedlea corchorifolia.

Malva rotundifolia.

Malva mauritiana : Gardens. "Til-chonee."

Urena lobata : "Soojia."

Sida rhombifolia : "Bhao." "Kala-bulee."

Sida cordifolia and ——— .

Lagunea lobata.

Hibiscus aculeatus : "Fields."

Abelmoschus pungens and *cancellatus* : "Kupusya."

Corchorus acutangulus and ——— .

Triumfetta oblongata : "Leshwa." "Koomuria."

Triumfetta angulata.

Grewia oppositifolia : "Bhengool."

Grewia asiatica, var. *nana* : "Phursia."

Ammannia rotundifolia : "Durmeea." Very common.

Ammannia sessiliflora.

- Grislea tomentosa* : " Dhoula." To 6000 feet.
Cedrela serrata : " Dhul."
Cedrela tuna : " Toonnee."
Rhamnus virgatus : " Chudooa."
Sageretia oppositifolia : " Uglai." From 2000 to 5000 feet.
Berchemia floribunda : " Kala-lug."
Ceanothus flavescens : " Ghont."
Euphorbia pentagona : " Sehoond." To 6000 feet.
Euphorbia angustifolia : " Muhabeer." " Doodhila."
Euphorbia hirta and *involuerata*.
Emblica officinalis : " Amla."
Phyllanthus parvifolia, (Don.)
Phyllanthus retusa : " Dhunee."
Phyllanthus leucopyrus : " Ainta."
Phyllanthus urinaria : " Seeahee."
Glochidium bifaria : " Mowee." " Bukulwa." " Byrmoua."
Cluytia ?
Rottlera tinctoria : " Rooenee." Upper limit 4000 feet.
Evonymus Hamiltoniana : " Ugnoo."
Staphylea Emodi : on Siyahee Devee.
Portulaca oleracea : " Loonia." " Koolfa."
Gypsophila vaccaria : cornfields.
Silene Falconeriana : (*S. armeria* naturalized.)
Arenaria serpyllifolia, and *muralis* : N. S. Edgeworth.
Leucostemma angustifolia : on every terrace-wall.
Stellaria media.
Schizotechium crispatum : Siyahee Devee.
Cerastium triviale, var. *glomeratum*.
Drymaria cordata.
Polycarpæa corymbosa.
Ruta albiflora : " Oopuniya-ghas." Descends to 5000 feet.
Xanthoxylon hostile : " Teemoor." " Tejbul."
Xanthoxylon tomentosum : " Seemoor." N. S. Edgeworth, 6500 feet, north face of Bandunee Devee.
Geranium Nepalense and *bicolor*.
Impatiens umbrosa.
Tropæolum majus : naturalized.

- **Oxalis corniculata* : "Chulmoree."
Coriaria Nepalensis : "Mukola."
Photinia dubia : "Gur-mehul." "Soond."
Pyrus variolosa : "Mehul."
Cratægus crenulata : "Geengaroo." Passim.
Cotoneaster microphylla : "Gurree."
Rosa Brunonii : "Kooja."
Rubus rotundifolius : "Heesaloo." Passim.
Rubus tiliaceus and *lasiocarpus* : "Kala-heesaloo."
Spiræa cuneifolia : "Jhar."
Spiræa chamaedrifolia.
Fragaria indica.
Potentilla ———, 2 species.
Cerasus pudum : "Puya."
Cydonia vulgaris : "Bihl."
Armeniaca vulgaris : "Chooaroo." "Zurdaloo."
Persica vulgaris : "Aroo." Does not ripen its fruit.
Prunus : two cultivated species : "Ludakh" and "Bhotiya-budam."
Prinsepia utilis : "Jhutela," "Dhutela." Passim, and in flower all the winter : the name means "tangled."
Crotalaria sericea, *anthylloides*, *alata*, *prostrata*, and *albida* : all known as "Goongree." The claws and lower side of the wing and Kul petals of the first are copiously ciliate : otherwise the name is very inappropriate.
Melilotus parviflora.
Lotus corniculatus : on every wet bank.
Trifolium repens and *pratense* : introduced.
Trigonella fœnum-græcum : "Methee." Cultivated.
Indigofera atropurpurea : "Kala-sukena," or "Sukna."
Indigofera pulchella and *Dosua* : "Sukena."
Indigofera ——— "Moos-sukena." A low shrub.
Indigofera prostrata.
Indigofera hirsuta : "Nanee†-goongree." "little *Crotalaria*."

* Moonshee Murdan Uleo gave me a specimen of *Oxalis acetosella*, gathered somewhere, he said, in the Himalaya, and was surprised that Dr. Royle had not mentioned it.

† "Nana : " this word, neither Hindee nor Sanscrit, is the common Kumaon term for "small : " a curious coincidence with the Latin. The Khuziyas of this province say that

Robinia macrophylla : "Goujha." Upper limit, 4000 feet.

Pisum arvense : "Kulon." "Kolai." *S. Kulayu* : "generating wind."

Vicia sativa, var. *angustifolia* : "Koor-kosha."

Lathyrus angulatus, *aphaca*, and *Sativus* : "Matur." The first "Goor-kosha."

Ervum hirsutum : "Kooree."

Zornia angustifolia.

Æschynomene indica.

Smithia ciliata : very common by streams.

Alysicarpus vaginalis and *bupleurifolius*.

Uraria alopecuroides and *picta*.

Desmodium gyrans, *triflorum*, *parvifolium* and *polycarpum*.

Lespedeza elegans.

Oxyramphis macrostyla, *himalensis*, and ——— .

Dumasia villosa.

Mucuna pruritus : "Goncha."

Erythrina arborescens : "Roongura." 4000 to 6500 feet.

Dolichos ——— : "Moos-kela." A procumbent species with deep-red flowers, and edible tuber.

Cantharospermum pauciflorum ? and ——— .

Eriosema ——— . "sp. very common on Simtola Hill : 5000—6000 feet.

Phaseolus scaber : "Guhutia." Sweet Pea.

Phaseolus angustifolia : "Bun-moong."

Rhynchosia ?

Flemingia semialata (to 6000 feet) "Bhutooa : " and sp. resembling *procumbens*.

Dalbergia robusta.

Edwardsia mollis : "Puhur-goongree."

Cæsalpinia sepiaria : "Kurounj." "Aglä."

their dialect comes closest to that of Bhojpoor in Behar. Kumaon may have been colonized by that warlike district.

A "Khus" dynasty is said to have expelled for some ages, the Rajpoot line (from Jhoosee near Allahabad) which, founded by Somchund, reached down to the Gorkhalee conquest. The names of these autochthonal chiefs, which are still in common use, are, the last two excepted, not at all Hindoo : they are given thus : Beejud, Jeejud, Jajud, Jud, Kaloo, Kulsoo, Jahul, Mool, Goonakur, Kesda, Nagoo, Bhagoo, Jypal, Soupal.

Cassia tora, *absus*, *purpurea* : "Bunar."

Cassia amæna, *pumila*, *wallichiana*, and *dimidiata* : "Silputiya."

Bauhinia variegata : "Khwyral." 6000 feet W. face, Kaleemuth.

Acacia mollis : "Burou."

Saxifraga ciliata : "Silphora."

Tillæa pentandra.

Kalanchoe varians : "Noonoo." "Bukulputa."

Sedum adenotrichum.

Rhus parviflora : "Runnel." "Rai-toong."

Rhus velutina : "Toong."

Rhus semialata : "Dukmeela," "Dutmeela."

Rhus vernicifera : "Bhuliou." "Goor-bhuliou."

Rhus acuminata? "Kakursinghee," i. e. "crab's claws:" from the long curved excrescences. The timber is exceedingly beautiful.

Alnus obtusifolia : "Oodeesh."

Urtica parvifolia : "Shishona." Buffaloes are fed on the bruised leaves and shoots, which are also the favorite food of several caterpillars.

Urtica heterophylla : "Awa." "Bichhoo." The *Babur* of Simlah : the fibre makes good cord and twine, which however perish speedily from moisture.

Urtica pentandra : "Jephul-juree."

Bæhmeria salicifolia : "Tooshiaree" or "frosty-leaved."

Bæhmeria platyphylla and *rotundifolia* : "Gurgela."

Procris punctata and *peduncularis* : "Souchula." "Golka." Used as a vegetable.

Cannabis sativa : "Bhung," "Bhanga." Forms a rank and offensive jungle, and should be eradicated in the vicinity of the town. It is cultivated in Gungoleehath and other parts of the province.

Humulus lupulus : Hop. Flowers well at Hawulbagh, but not at Mussooree (Dr. Jameson.)

Morus serrata : "Kemoo."

Ficus laurifolia : "Doodhla."

Ficus macrophylla : "Timla."

Ficus rotundifolia? "Beroo."

} Edible.

Ficus ovata? (Don.) "Bedoolee." Creeps extensively over rocks and trees : perhaps *F. Luducca*, Roxb. Edible.

Ficus Luducca? "Kabra."

Ficus chincha? *foveolata*? "Kismira." "Kewnia."

Ficus cunia: "Kewnia."

Ficus.

Celtis tetranda: "Khuruk." Grows to be a large tree, much planted about the villages, as the boughs fork conveniently for the stacking of hay, grass, straw, &c. The male flower is frequently pentrandrous. Flourishes to 7000 feet at Simlah.

Myrica sapida: "Kaephul." The fruit is brought in large quantities to Almorah, and the bark is exported to the Plains as a dye and medicine.

Salix tetrasperma and —————: "Bhynah."

Juglans regia, Walnut: "Ukhrot." S. Ukshod. Akhod. "Ukor."

Peperomia saxatile: "Methia-banda."

Osyris Nepalensis: "Bukurdhura."

Elaeagnus gheewaeen: "Gheewaeen." Edible Oleaster.

Daphne cannabina: "Set-burwa." Paper shrub.

Cinnamomum albiflorum: "Tujpat." "Kirkiria."

Amaranthus spinosus.

Alternanthera nodiflora.

Celosia argentea: "Siralee." "Ghogia."

Ærua lanata: "Sajee."

Pupalia squax: "Jhut-kooree."

Achyranthes aspera. The Oude Rajpoots consider this plant to be a safeguard against scorpions, which it is believed to paralyse. This corroborates Sir W. Jones, (As. Res. IV. 300.) "The vulgar name, however, of the Ichneumon Plant is Rasun, (Rasna?) * * * it is asserted by some that the Rasun is no other than the rough Indian *Achyranthes*." Dr. Royle states that the leaves of *Salvadora* (Peeloo, Jal,) are sold in the bazars as Ra-suna; this may signify "Mustard Senna;" the leaves and fruit having the pungency of mustard or creas: a circumstance which led Captains Irby and Mangles as long ago as 1817 to identify the *Salvadora* with the Mustard Tree of the N. Testament. But Dr. Falconer has since ascertained Ra-suna to be the leaves of *Berthelotia lanceolata*, which is indeed called Resun at Feroz-poor: apparently the S. Rechuna, from rechun, cathartic.

Chenopodium album: "Bhutoca."

Ambrina Botrys.

Bcta bengalensis : "Palung."

Phytolacca acinosa : "Jirrug."

} Cultivated.

Rumex nepalense : Dock. "Huloonia."

Rumex hastatum : Sorrel. "Ulmoru."*

Fagopyrum vulgare : "Ogul." Buckwheat. Cultivated as a vegetable. The species, *F. emarginatum*, grown in the Upper Himalaya, is called "Phaphur;" a nomenclature reversed by Dr. Royle.

Fagopyrum corymbosum : "Bun Ogul."

Polygonum convulvulus, repens, recumbens, lanigerum, scabrinervium, herniarioides, glabrum.

Mirabilis jalapa. Completely naturalized, and of many varied colors : the blossoms open regularly about 4 P. M. The name "Gool-bansa," or Flowering Justicia, may be the origin of Gool-Abbas.

Boerhaavia procumbens.

Cocculus laurifolius : "Keekra." "Tilbura," "Tilpara."

Cocculus Roxburghianus : "Gujera." "Gurjial."

Cissampelos convulvulacea : "Paree."

Clypea. N. S. Edgeworth.

Stauntonia latifolia : "Gophla." Edible.

Andromeda ovalifolia : "Uyar."

Rhododendron arboreum : "Booroonsh." } Nearly exterminated

} about Almorah.

Primula speciosa : "Biskhopra." "Jul-kootia." Abundant by streams from 3500 to 5500 feet, and considered poisonous to cattle.

Anagallis cærulea : "Jonk-mura." "Jynghunee." Triturated, it is employed to poison fish, and to expel leeches from the nostrils.

Lysimachia alternifolia, pyramidalis, lobelioides.

Androsace rotundifolia and incisa.

Samolus valerandi : On the Suwal.

Myrsine bifaria.

* Almorah has its name from the prevalence of this plant; Musooree from *Coriaria nepalensis*; and Simlah perhaps from the Semul, there being a Simlah at Calcutta also. In this, the people only follow the example of their fathers, who were so addicted to botanical nomenclature, that six out of their seven Dweeps are named from plants: viz. Jumboo: *Eugenia jambolana*. Koosh: *Poa cynosuroides*. Pluksh: *Ficus infectoria* and *religiosa*. Salmulee (Semul): *Bombax malabarica*. Sak: *Tectona grandis*. Pooshkur: *Nelumbium speciosum*. All tropical, or nearly so.

Symplocos paniculata : "Lodh." The tree which grows from 7000—9000 feet seems to be a distinct species.

Ilex excelsa.

Cuscuta grandiflora : "Akash-luggoolee."

Porana ramemosa.

Evolvulus sericea.

Aniseia barlerioides : Banks of the Kosilla : 4000 feet.

Ipomæa cærulea, muricata, pes-tigridis, sphaerocephala.

Pharbitis purpurea : naturalized.

Lobelia trialata.

Campanula ramulosa? *pallida*, and *sylvatica* (*integerrima*, Don.) The last, which abounds from 4000—8000 feet, much resembles *C. lancifolia* in Wallich's Ed. of Roxburgh, F. T.

Cephalostigma hirsuta.

Hamiltonia (*Leptodermis*) *lanceolata* : "Pudera." Passim.

Hamiltonia azurea : "Jogia-pudera." Very sweet when let alone; extremely offensive, when bruised.

Gardenia tetrasperma : "Burra-gurree."

Hymenopogon parasitica : "Bhynsia-pudera." Oaks, 7000—8000 feet. Binsur.

Argostemma sarmentosa.

Kohautia coccinea and *gracilis*.

Hedyotis Burmanniana and *Lindleyana*.

Spermacoce articularis and *stricta* : the last to 6000 feet.

Knoxia mollis.

Rubia cordifolia : "Mujethee." Madder.

Galium latifolium, (*elegans*, Wall.) and *asperifolium* : "Kooree." *G. aparine* in cultivated land.

Lonicera diversifolia : "Bet-kookree."

Vernonia anthelmintica : "Kaljeera." *Cinerea* : and var. *scabrida*.

Adenostemma latifolium.

Eupatorium longicaule : at 6000 feet, Binsur road.

Aster bellidifolia : "Murch-mool."

Callistephus sinensis : China aster. "Nypala:" said to be originally from Nepal.

Leptocoma racemosa : (Siyahée Devec.)

Bellis perennis. Introduced from Ireland and flowered for the first time, August 14, 1847 : continuing to bloom most of the year.

- Myriactis oleosa.*
Solidago nepalensis.
Amphirapis cuspidata.
Sphaeranthus mollis.
Dicrocephalus gracilis.
Cyathocline lyrata.
Conyza pinnatifida and *veronicæfolia.*
Blumea alata : "Umdok,"—and *lacera.*
Inula cappa : "Tamagurree."
Vicoa indica.
Eclipta prostrata and *erecta.*
Siegesbeckia orientalis : "Gobureea."
Xanthium indicum : to 5000 feet.
Zinnia elegans and *multiflora* : naturalized.
Wedelia ——— : Eagerly eaten by rabbits : "Koorshinia."
Calliopsis tinctoria : naturalized.
Bidens Wallichiana, *bipinnata*, and *repens* (*trifida*) : "Kutaree."
Artemisia indica : Wormwood. "Patee." Offered to the gods.
Artemisia scoparia (*elegans*, Roxb.) "Jhao."
Artemisia parviflora.
Gnaphalium hypoleucum ? and *ramigenum.*
Filago indica.
Antennaria contorta and *semidecurrens* : "Jhoola." "Bokula."
 "Goofa." The tomentum is in general use for tinder and moxa.
Carpesium trachelifolium : 7300 feet, Binsur Temples.
Emilia sonchifolia.
Senecio pallens : "Rut-putya."
Echinops nivea : Globe-thistle.
Aplotaxis carthamoides.
Tricholepis reticulata.
Echenais ? *ferox*, N. S. Edgeworth.
Echenais arachnoidea : N. S. Edgeworth. "Thukyla." White This-
 tle: root edible.
Serratula pallida ; lowest limit, Almorah.
Ouoseris lanuginosa : "Kupasee." The tomentum, "Kuphee."
Leucomeris spectabilis : "Punwa." 6000 feet on Kaleemutia.
Berniera nepalensis (*Chaptalia maxima*, Don.) 7000 to 7500 feet on
 Binsur.

Leontodon taraxacum and *erriopus*.

Tragopogon elegans.

Sonchus arvensis and *Royleanus* : "Oophut Kunyla." "Nulsha."

The last is eaten.

Prenanthes (Lactuca) procumbens, Roxb. *Microhynchus patens*.

"Tungulee-gobhee." A favourite food of rabbits and chukors.

Lactuca arvensis.

Barkhausia aspera; N. S. Edgeworth. Cultivated grounds from 5000 to 7000 ft.

Youngia runcinata,

Plantago erosa : (Don.) "Lohooria : " and *lanceolata*.

Scabiosa candoliana : "Nara." Descends to 5000 feet.

Dipsacus ? (lilac) "Narou." Root used in washing the hair.

Valeriana Hardwickii : "Shumeo."

Valeriana elata.

Plumbago Zeylanica.

Ehretia serrata : "Poonya."

Heliotropium brevifolium : much resembles a sp. common at Lodi-hana.

Trichodesma indica.

Cynoglossum canescens and *glochidiatum* : "Kooree."

Plectranthus cordifolius, *rugosus*, *Gerardianus*, *Coetseae*, *rubicundus* (Don.), and *pilosus*.

Coleus barbatus : "Feevae." Passim.

Pogostemon plectranthoides : "Boodla," "Roodra." "Kala-bashing."

Dysophylla cruciata : swamps.

Elsholtzia pilosa and *crenata*.

Elsholtzia polystachya, (*flava* ?) : "Bhungria." Descends to 5700 feet.

Colebrookia oppositifolia : "Doolshut." Ascends to 5500 feet.

Perilla ocimoides : "Bhungera." Cultivated : but apparently wild in the Bhabur.

Mentha viridis : "Poodeena." Quite naturalized, but popularly said to be of English introduction.

Salvia lanata : "Gannaia." Sage.

Salvia plebeia. Hawalbagh.

- Origanum normale* : "Bun-toolsee."
Thymus serpyllifolius : "Bun-jowain."
Hedeoma nepalense.
Micromeria biflora.
Melissa repens and *umbrosa* : (*M. flava*, at 8000 feet on Biusur.)
Scutellaria linearis, *repens*, and *scandens*.
Anisomeles ovata.
Lamium amplexicaule.
Stachys sericea.
Craniotome versicolor.
Roylea elegans : "Tit-patee." "Barh-ka-teeta," i. e. Hedge bitter.
Leucas lanata, *indica*, *cephalotes*.
Teucrium quadrifaria.
Ajuga parviflora and *bracteosa*.
Verbena officinalis.
Clerodendron serratum, *odoratum*, *ternifolium*, *fetidum*.
Callicarpa incana : "Duya."
Vitex negundo : "Shiwalee."
Premna barbata.
Bignonia suaveolens : "Padul." Upper limit, 4000 feet.
Didymocarpus lanuginosus.
Strobilanthes attenuata and *glutinosa* : "Kupoor-nulee."
Barleria ciliata : "Surp-jeeba." Seeds employed to cure snake-bites.
Adhatoda vasica : "Bashing." Indigenous to 4500 feet : the stems are used for gunpowder charcoal.
Lepidagathis hyalina and *cuspidata*.
Rostellaria procumbens.
Dicliptera bupleuroides.
Utricularia stellaris.
Verbascum Thapsus : "Ekulbeer."
Linaria incana : (*L. bipartita* : naturalized.)
Antirrhinum orontium : cornfields.
Scrophularia auriculata : "Gujjyla."
Mimulus nepalensis.
Mazus surculosus, and *rugosus*.
Lindenbergia grandiflora and *ruderalis*.

Limnophila menthastrum : "Jungulee Sonf." "Loung-mooshk."

Limnophila hypericifolia : (*Cybbanthera connata*, Don.)

Herpestis Monniera : "Jul-neem" of the Plains.

Vandellia pedunculata and *nummularifolia*.

Bonnaya bracteata (and *grandiflora*?)

Buddlea crispa and *Neemda* : "Bhatee." "Dhoula." "Shioontra."

The first is very fragrant.

Veronica anagallis, *agrestis*, *deltoides*? and *biloba*.

Buchnera hispida : (blue.)

Striga lutea and *euphrasioides*.

Gerardia delphinifolia : (yellow.)

Centranthera hispida.

Pedicularis carnosus.

Solanum rubrum : "Chhota-gheewacen." Ink is made from its juice.

Solanum verbascifolium : "Usheta."

Solanum lycopersicum.

Physalis peruviana.

Nicandra physaloides. } Naturalized.

Datura alba and *ferox* : a var. of the latter? with double yellow flowers is commonly planted by the temples of Muhadeo.

Nicotiana tabacum : cultivated : 2 varieties. "Tumakoo," "Dhumakoo."

Petunia phænicea : naturalized.

Pladera pusilla.

Gentiana marginata and *pedicellata*.

Ophelia angustifolia and *alata* : "Cherayuta." From the S. "Kirata-tikta," *the Bitter of the Kiratas*, the *Kirrhadae* of the Greeks, still existing as the *Kirantis* and *Limboos* about the sources of the *Kosee*, as we learn from *Hodgson*, *Campbell*, and *Kirkpatrick* : the latter states that they conquered *Nepal*, and it is probable the *Newars* are their descendents. The mountain name of the plants is "Teetakaan," from the S. "Kanda tikta," *Bitter stem*.

O. paniculata, *purpurascens*, *cordata*, abound on all the neighbouring mountains.

Alstonia lucida : "Doodhee."

Nerium odorum : "Kuniyoor." Banks of *Kosilla*.

Vinca parviflora.

Ceropegia wallichii, and *gracilis*, (N. S. Edgeworth.)

Marsdenia Roylei : "Moorkeela."

Marsdenia mollis : (undescribed, Edg.)

Cynanchum glaucum and *Dalhousiæ*.

Cryptolepis reticulata: up to 4000 feet.

Gongronema ——— : N. S. Edgeworth : common climber on the granite rocks, Almorah to the Kosilla.

Pinus longifolia : "Cheer," "Surul," "Sulla:" the first is from the Sanscrit "Ksheerahva," Milky, resinous. It descends to 2500 feet along the Surjoo.

Equisetum : "Guthia." "Poodpoores."

Curcuma angustifolia : "Huldee."

Curcuma kuchoor : "Huldee." Cultivated.

Hedychium coccineum : "Rukto-huldee."

Hedychium spicatum : "Kuchoor-kuchree." The rootstocks are pounded down with tobacco intended for the Hookka.

Hedychium flavum : "Keola." Gardens.

Canna speciosa : "Keewara." Ditto.

Globba secunda? Hawalbagh.

Amomum subulatum? "Ilachee." Gardens.

Curculigo orchioides : "Petaree." Up to 6400 feet.

Hypoxis minor.

Crinum : "Chundur-Kunwal." "Pindur." "Kunmoo." A garden sp. not agreeing with any in the *Flora Indica*.

Pardanthus sinensis : "Kutar-puta." Passim.

Iris nepalensis : "Kutaria." "Neel-Kumul" Gardens, and about temples.

Cyrtopera flava. To 4500 feet.

Satyrium nepalense. Descends to 4000 feet.

Platanthera susannæ, *pectinata*, *arcuata*.

Habenaria rostrata.

Gymnadenia? *commelynæfolia*. At 6000 feet on Kaleemuttia.

Phœnix sylvestris (*humilis*) : "Khujoor." "Thakil." To 5000 feet.

Paris polyphylla. Descends to 5000 feet.

Anguillaria indica. To 6000 feet.

Gloriosa superba : " Bish-nangul."

Lilium wallichianum.

Fritillaria Thomsoniana.

Tulipa stellata : " Mijhoula." " Nulkia." Abundant in the cultivated ground : the bulbs are edible and exported to the Plains.

Scilla indica : " Ghesooa." To 6400 feet.

————— Summit of Kaleemuttia, and near Pugog village, Simla.

Liriope spicata : (*Ophiopogon*).

Polygonatum cirrhifolia.

Uvularia Leschenaultiana.

Asparagus adscendens : " Khyrooa."

Yucca gloriosa : naturalized.

Aloe perfoliata : " Gheekwar." Gardens, but rare.

Smilax villandia : " Kookurdhura."

Juncus bufonius : " Sheem," " Chhota Guthia." Passim in swamps, &c.

Commelyna obliqua : " Kanjura." " Kana." Root edible.

Commelyna. Two other undetermined sp.

Cyanotis barbata.

Dithyrocarpus paniculatus (*Tradescantia paniculata*, Roxb., and probably *Aneilema hispida*, Don.) " Kundera." To 4500 feet.

Murdannia scapiflora.

Pontedera vaginalis. Ricefields.

Dioscorea versicolor : " Genthee." Deliciously fragrant.

Dioscorea sagittata : " Tyr." " Turoor." Tubers edible, lying from 3 to 6 feet deep in the soil.

Dioscorea pentaphylla : " Tegoona." " Takoolee."

Dioscorea quinata : " Muggia." " Moonia." Tubers white, edible.

Dioscorea deltoidea : " Goon."—Siyahes Deves.

Sauromatum guttatum : " Kala" or " Chilia-bank."

Arum hastatum.

Arum colocasia, (Roxb.) " Jungulee-gheoeea." " Roolkia." " Gur-papur." Leaves edible.

Arissema : several sp. " Surp ka goga." " Samp ka bhootta," i. e. Serpent's maize.

Remusatia vivipara : " Banj ka pindaloo." Passim on rocks and oaks from 3000 to 8000 feet.

Acorus calamus. "Buj," "Buch." The dried rhizomas are put amongst seed corn to preserve it from the weevil: they are also worn as an amulet against sorcery: ("goor-buch.")

Potamogeton mucronatum: "Putulia."

Lemna (minor?) "Kall." "Turai."

Azolla, "Pun-tyra." "Turai." Covers the pools, &c., of a deep red all the spring. Believed to fall with the rain.

Saccharum spontaneum: "Jusha," "Jhansh." The blades of its long rooting sarculi, are substituted by the Almorah Brahmans, in various religious ceremonies, for the *koos*, which they teach the people is this *saccharum*: its proper name, "Kas" is transferred to a beautiful species of *Erianthus*. *Saccharum procerum*, "Ramshur," is planted near sacred wells, but does not appear to flower at Almorah.

Imperata cylindrica. "Shiro."

Arundo karka: "Nultoora." To 5000 feet. Baskets, &c., are made from its culms.

Thysanolaena agrostis, (*Agrostis maxima*, Roxb.) "Ousa," "Ouns." Up to about 5000 feet.

Andropogon calamus—aromaticus: "Boojura," "Palakhuree." Gives the mountains at 5000 to 6000 feet, their rich brown colouring in Nov. Dec. The seeds seem different from those of the *Neemaroil*-grass: and have neither the same pungent odour or oily feel.

Andropogon punctatus.

Andropogon cæruleus: "Ghweria," excellent forage.

Andropogon (*Rhaphis*) *microstachys*: "Cheroula." "Chura." "Pulkia."

Andropogon contortus: "Koomuria." Spear-grass.

Rhaphis Royleana: "Salim."

Cymbopogon —————: "Peeria." Aromatic.

Perotis latifolia,

Erianthus: "Kas."

Erianthus: "Nounia" (Butter): "Telia."

Erianthus.

Anthistiria anathera: "Chooneria." "Jyotishmati," roots frequently luminous.

Ischæmum corollatum: also called "Nounia."

Coix gigantea: "Loochoocha."

Paspalum longiflorum : "Kana." Ricefields.

Panicum frumentaceum and *chamæraphe*.

Panicum miliaceum, apparently wild at Hawalbagh.

Panicum colonum : "Soun." "Junglee Mandira."

Pennisetum triflorum : "Bemulshia."

Setaria glauca.

Aristida cyanantha : "Binnia." "Kukulshena."

Sporobolus elongatus.

Polyopogon fugax : "Geewa." "Geecolia." In streams.

Cynodon dactylon : "Doob."

Digitaria Roylei.

Eleusine indica.

Avena fatua : "Jou-ata." Corn-fields : the straw is given to cattle : but is suspected.

Poa.

Eragrostis.

Briza.

Plagyselytrum filiforme.

Arundenella miliaris and *hirsuta*.

Bambusa. Grown at Dhamus, 4000 feet, for baskets.

Lolium temulentum. Corn-fields.

Carex indica. Binsur, &c.

Tsolepis trifida.

Scirpus muticus.

Eriophorum comosum : "Babila." "Babeo." "Babur." "Byb."

The rope made of this, is in general use : the Almorah species, "Pun-babeo" is by the people distinguished from that which yields the "Byb : " but apparently without foundation : they believe that the latter never flowers.

Cyperus tenuiflorus.

Cyperus ——— : "Motha." Used for mats.

Mariscus dilutus ? "Pun-motha." "Nagur-motha."

Lipocarpus argentea.

Eriocaulon sollyanum. Passim, swamps.

Adiantum capillus-veneris : rhizophorum.

Asplenium sinuatum : Walls.

Asplenium polymorphium : "Lingra."
 Nephrodium eriocarpum : "Kootra." } young
 fronds
 edible.

Botrychium ——— : "Bish-Kootra."

Woodwardia radicans.

Cheilanthes dealbata ? Walls.

Pteris ——— : "Roun."

Platyloma ——— : Rocks, 4000 feet.

Lygodium semibipinnatum ? "Murora." "Bun-dhuniya."

Lycopodium tenellum : obtusifolium ? Oaks on Jagesur at 7000 feet :
 and the beautiful L. setaceum ? on the Ramgunga at 4800. (R. S.)

Lycopodium circinale ? Damp rocks, 4000 feet.

Agaricus ——— Mushroom : "Chheoo," "Chhao"

Lycoperdon. Puffball : "Phuskia." "Houla-toomree."

The list of grasses and ferns might be much extended.

The *Cerealia* and Leguminosæ, &c. cultivated about Almorah, and generally in Kumaon, consist of, for the Rubbee crop, reaped in April and May.

Triticum vulgare : "Lal Gehoon," "Tanga," and "Joosher." The red or bearded varieties : Daood khanee or Duwa the white or awnless : the last sells at from four to six seer per rupee less than the first, and is grown in large quantities about Somesur, &c. "Kunnik" in this Province denotes flour, not the grain.

Hordeum hexastachyum : "Jou." A short-awned variety is called Rena.

Hordeum cæleste : "Ooa-jou."

Pisum arvense : "Kulon." "Grey Pea : *Ervum lens*, "Mussoor," Grey Lentil ; *Cicer arietinum*, "Chuna," Gram, are also grown, the last two sparingly, in the warmer locations and are reaped at this season.

Papaver somniferum : both white and purple. "Posht." Opium is made to a small extent, chiefly in Shor : but in the Gurhwal raja's territories, it is said to be abundantly produced.

Sinapis glauca : (Boyle ?) *dichotoma* ? (Roxb.) is much grown either alone or with barley, for its oil : *S. glauca*, (Roxb.) "Daeen," "Dyn," "Rara," or "Rada," though it affords more oil, is much less common, requiring a very rich soil.

In the environs of Almorah, the "Juria" or "Judia" is a favorite

crop, as an oil-seed : it is probably *Sinapis dichotoma*, but much resembles *Brassica rapa*, and the males all assert that it may be and is converted into the Turnip.

Several species of sinapis are also grown as salads, *turkarees*, and condiments, of these :

“Burlai” is *S. ramosa* : “Rae” of N. India : *S. rajika*, from *raj*, to shine : very appropriate to the whole genus in flower : or from *raji* a row, a line, in which they succeed much better than in plots.

“Bhotiya-rae” : “Badshahee-lai ;” *S. rugosa*. Introduced by the Gorkhas, and greatly valued. They also brought from Nepal another “Badshahee-lai,” called “Kurm-kulla,” probably *S. brassicata* : but it has disappeared. This species is nearly allied to *S. ramosa*. It has been introduced to the Dehra Dhoon.

“Rae.” “Mukura-rae” (Tarantula mustard) of Hindoostan : the “Surshuf” of the hospitals, where this species is employed : the seeds and the leaves being exceedingly pungent. It is not described in the *Flora Indica*, but approaches *S. erysimoides* : and is probably *S. ———* near *S. nigra* : *S. sinensis* in Ainslie’s *Mat. Med.*

“Doowa.” “Chara.” *Eruca sativa* : comes up accidentally with the above : but is not cultivated.

The “Khurbee” or autumnal Harvest, comprizes a less valuable but more numerous catalogue, on which depends generally the subsistence of the lower classes.*

Oryza sativa : “Dhan.” The rice is sown about the middle or end of April, either in beds, “Khiaree,” from which it is transplanted ; or

* About the middle of July, (on the 1st of Sawun) is celebrated the greatest of the Khushia festivals, known as the “Huriyals,” a name marking the universal verdure and the appearance of the ear in the corn at this season. This occasion embraces both harvests, small patches of wheat and the other rubbee grains being raised purposely ; so that bouquets of all the cerealia and leguminosæ (Mundoo and Bhut excepted) may be presented to the gods. On this day, also, the mountaineers generally deck their own heads with a few blades of corn, exactly as the shamrock and leek are worn in Ireland and Wales, originally, perhaps, for the same reason.

On the 1st day of the Indian Bacchanalia (the Hoolie) about the middle of March, the Gorkhas of the Kumaon Battalion, proceeding to the East, deposit some coins, &c. at the foot of a wild Pear tree, which is afterwards cut down, and ornamented with innumerable shreds of red cloth, (from which it is called the Cheer,) is carried in procession and planted in front of the lines with boisterous merriment : and is sung and danced round daily till the orgies are over : it is our own May-bush precisely, the pear-tree being no doubt chosen for the same reason of its being then in full blossom.

less frequently, in the fields where it is to remain. These are carefully and laboriously manured and worked up by the treading of cattle : and in May, the task of removing the young plants from the nurseries falls on the women and children, who work cheerfully under a sun which would be fatal to the European. They are also the only reapers and weeders of the province, and are, in truth, little better than slaves. During the wet season, and indeed at all seasons, the crop is kept constantly inundated : and had Collins ever tried the experiment, he would never have written the line " what times 'tis swe et o'er fields of rice to stray." In the upper grounds the people well understand the propriety of the rotation of crops : but where a copious supply of water and a hot sun are conjoined, rice seems to be planted from year to year. The Harvest takes place from the middle of September to that of October. There are many varieties of this grain ; the best has its name from the Salim district on the Punar river, S. E. of Almorah.

Sorghum vulgare : " Joonulee : " S. Yonul. Little grown.

Panicum frumentaceum ; " Mandira." " Jhoongura." " Sama."

Panicum italicum : " Konee," " Kungnee."

Panicum miliaceum : " Cheena."

Eleusine corocana : " Mundooa." The latest crop to ripen, and most extensively grown, though a bitter and indigestible food. The grain is rudely broad-cast, and afterwards transplanted and regularly distributed during the first heavy showers of June.

Zea mays : " Mukkuee." " Bhootta."

Amaranthus anardana : " Chooa." " Ramdana."

Amaranthus speciosus : The drooping ditto : gardens.

Fagopyrum vulgare : " Ogul." Buckwheat.

Perilla ocimoides : " Bhungura."

Sesamum orientale : * " Til." The white variety, " Tilee."

* This plant, (with black seed) wild everywhere in the Kumaon. Bhabur is largely cultivated as high up as Almorah. Dr. H. H. Wilson, in an interesting paper in a recent number of the R. A. Society's Journal, comparing the Indian festivals with those of Europe, remarks the custom of the Greeks on occasion of marriages to mix Sesamum in the sweetmeats distributed to the friends and guests of the parties. The same practice is universal amongst the people of Kumaon ; " Luddoo" being the vehicle used. From the Sanscrit 'til,' to be unctuous, probably comes the Latin *Tilia* ; our English " Lime" may allude to the same honey-like exudation from the leaves.

Solanum melongena: "Baingun." "Bhutta." A very fine variety of a rich purple color which gives the adjective "baingunee."

Saccharum officinarum: "Rikhoo" (from Sans. riksh, to cut?) "Gunna." The large variety is called "Poona," the small, "Kanthee Rikhoo." Chiefly from the districts about Dwarahath and Gungoleehath.

Colocasia Himalensis: Royle. "Ghweea" of the Plains: two varieties, the white, "Pindaloo," the red, "Guderee;" the leaf "Papur," and the unrolled leaf "Guba" are also edible.

Capsicum frutescens: "Koorsanee."

Solanum tuberosum: "Aloo." The Potato, from English tubers, introduced in 1843, by Major Welchman, yields excellent produce at Almorah and Lohoochat; up to the end of 1847, no vestige of the *rot* has shown itself: the hypothesis, therefore, that the Plant is worn out by continued propagation from the tubers cannot be sustained.

Cucurbitaceæ: Almorah is supplied with most of the kinds which grow in northern Hindoosthan: *Cucumis sativus*, "Kakura," very large: *Charantia muricata*, "Kurela:" *Luffa acutangula*, "Torai:" *Luffa pentandra*, "Gheea Torai:" *Trichosanthes anguina*, "Chichinda:" *Cucurbita maxima*, "Gudooa," Kudoo:" *Lagenaria vulgaris*, "Louka," "Loukee:" a very fine variety introduced in 1846, from Jubulpoor, by the men of the first Co. 7th Bn. Artillery. The small variety is called "Toomree." *Benincasa cerifera* (*Cucurbita pepo*), "Bhoonja," "Petha," and "Kumhra."

Zingiber officinalis: "Ada:" grown in all the hot vallies. *Curcuma longa* (or "Kuchoor?" "Huldee:") ditto.

Dioscorea: "Genthee," and "Ghunjeer," or "Ghujeera:" cultivated: species unknown: the pundits affirm the Ghujeera and *D. quinata* or *pentaphylla* to be the "Kakolee" and "Ksheer-kakolika" of their old books. Generally amongst the cerealia, will be found some of the undermentioned leguminous plants.

Dolichos uniflorus: "Guhut:" the "Koolut" of the N. W.

Dolichos catjang: "Rensh," "Ree-ensh," or Rysh: 3 varieties, of which one is called "Sonta."

Soja hispida: "Bhut." Common about Almorah: "Khujooa" of Rohilkhund.

Lablab cultratum: "Sheemee:" gardens.

Phaseolus radiatus : "Oord."

Phaseolus mungo : "Moong," (rare.)

Phaseolus torosus : "Gooroush," or "Gooroonsh." One var. with red, another with cream-coloured seeds : these are grown at a higher level (6500 feet) than the other kinds of pulse : chiefly in Kalee Kumaon, but also cultivated about Almorah.

Almorah cannot boast of much or good fruit : the grapes are only fit for verjuice ; the apples and pears indifferent : the cherries only fit for Kirschenwasser ; the apricots for jam and pigs : there are two species of plum, palatable, but unwholesome ; one, a dark-blue damson, "Bho-tiya Budam," ripens in July ; the other, which is called "Ludakh," is orange-red, much larger, and ripens in June. Tolerable plantains are produced in the warmer vallies ; and the oranges, the best from the low vallies to the eastward, are excellent. The lemons produced about Almorah in the cold season, and allowed to mature in straw, are not to be excelled in size and flavor ; citrons "Beejoura," and "Kurunphul," are also grown : the shaddock and lokat ripen at Hawulbagh ; the sweet lime, "Umritphul," towards the Surjoo. The wild fruits "Kae-phul" (*Myrica sapida*), "Bumoura" (*Benthamia fragifera*), "Heesaloo" (*Rubus rotundifolius*), "Gheewaeen" (*Elæagnus gheewaeen*), come under Dr. Lindley' category, "Eatable, but not worth eating." In truth Almorah is not the spot for an epicure to fix on ; the feast of reason is the only one indigenous to the European ; and while his eye rests with delight on terrace rising above terrace for fifteen hundred feet following the N. dip of the strata, all green and glowing with the precious fruits of the earth enumerated above, and each, in autumn, divided by its white belt of "Jhoola," (*Anteunaria semidecurrans*), to him the welcome symbol of the coming winter, he must acknowledge that if elsewhere the proverb comes true that God sends us food and the devil cooks, at Almorah the last are better than the first, and that he must needs remain a gastronomic Manichæan. Such being the case, we may as well re-descend to the Plains and continue our lowland route eastward from Bumouree.

8th March, 1847.—From Huldwanee to Jam Goth, 6 or 7 miles ; path indifferent, and the jungle generally of small Khyr and Sissoo, with some Kunjoo, Huldoo, and latterly a few large Sal, now coming into flower. Many of the trees are leafless, while those on the heavily wooded mountains present a mass of verdure.

Close to Huldwanee cross the stony bed of the Goula, about half a mile across : almost all its waters are diverted above this into the numerous kools which irrigate the forest cultivation of Kounrpoor and Nongaoon Goths, at about the 4th mile on the route. They comprize a large tract of luxuriant wheat and mustard cultivation, the former now in the green ear, the latter ripe. Amongst the corn, I observed growing in abundance the *Lathyrus aphaca* "Ghora-Kulon," the *Lathyrus angulatus*, "Ningala-Koshee," (i. e. Hill-Bamboo Legume,) *Ervum hirsutum*, "Kooree," and *Melilotus leucantha*, "Gureela." The hemp plant is also abundant, but apparently less luxuriant than in the Hills. About 2 miles beyond Nongaoon is Jam, another Goth, where one of the sheds afforded a welcome refuge from the exceedingly hot sun ; the temperature too, is becoming so high, that the people are already sending their wives and children back to the mountains : these are about a mile and a half distant : the Sookhee nudee issues from them, and flows east of Jam, separating the Chhukhata Bhabur from that of Chou-bhynsia.

None of the people can give any etymology for this word Bhabur : or Bhawur : some have erroneously derived it from the Babur grass (*Eriophorum*) which does not grow here, but in the Hills ; and is also differently spelt, as applied by the people of Kumaon, it denotes the high and dry tract of *forest* land at the base of the mountains ; *Turrai*, a word which is scarcely known, is properly the tract of swamp and grass lower down, and may either come from the Persian *turree*, moisture, water, in opposition to dry land (Shakespeare) or from the Hindee *tule*, low, below ; by the Gorkhas the whole space is often called Mudhdes, "middle country," between the hills and plains, or rather perhaps, they preserve the favorite Hindoo notion that India is the central country of the world. It is strange enough that Humboldt (Cosmos, note 7,) should confound Madja-desa with the Chinese Mo-kie-thi, which is manifestly Magadha, or South Behar.

Jam is but a small Goth, and the people are in great fear of the tigers : a man was carried off from a field a week ago : and they assert that a few days since two of these "police of nature" fought, till one of them was left dead on the spot, nor far from this.

9th March.—To Chorguliya, about 9 miles, called 7 coss : the path stony and bad, generally close under the mountains, through dense for-

est of Sal, Semecarpus, Hymenodactum, &c. Near Jam hackery tracks come up perpendicularly to the Hills, for drawing the Sal timber. But most of the large trees near the route are gone. At about 5 miles pass a Goth called Surria Panee, from its lethæan stream of bad water, and two miles farther, where the Dewa debouches from the mountains, the richly cultivated and irrigated settlement of Lukhmun Mundeë : here the path leaves the base of the mountains, and two miles on, reaches Chorguliya, a large and ancient clearing, well sprinkled with huts and Goths, but without a tree to shade the luckless passenger, though millions are in sight all round. The place probably has its name from Chor-gurha, a pitfall, or Chorguliya, "defile of the thieves." The Dewa flows about a mile to the east, in several broad stony channels, covered as usual, with Seesoo, now coming into leaf and flower ; at present only one of these channels carries a small runnel of water. This stream rises amongst the lofty mountains of the Dhyanee Rao Pergunna, apparently from a huge bare range called Neta : it is known in the hills under the name *Nudour*, in the Turæe as the Dewa, and under the third name of Gurra, passes Pelecbeet and Shahjuhanpoor, and finally joins the Ramgunga.

From Chorguliya there are two routes to Burm Deo ; one makes a great circuit to the south, through the grass jungle to Nanukmuth, 12 miles, Suniya, 12, and Burm Deo 11. Nanukmutha is reported to have been founded by the prophet of the Sikhs, with a promise that the rule of his disciples should one day include it : there is a temple there, where the offering consists of the Soápnut, which, in its common form might imply a sarcasm on the personal purity of the divinity ; but in this case the fruit, called Goolia-reetha, is said to be sweet and edible, from a spot known as Raj ka Shera in upper Dhyanee Rao ; where if the chronicles lie not, grows a tree of which one side produces sweet, and the other, the common nut : the prodigy was effected by a hungry fakeer. Nanukmutha is 773 feet above Calcutta. Suniya, a mart for ratans, 829 feet, is the same as the Bilehree Mundeë of the maps, and I believe with Khetul Sanda. Between this line and the mountains, at from 8 to 16 miles distance, there is in the Choubhynsia district, an impassible belt of cane-brake, the favorite lair of the Cheeta (*Python tigris*) commonly called the Boa ; they also penetrate into the great vallies of the Surjoo, and are held in much terror by the people : the name is from "chitr," spotted.

The second route, which I followed, contrary to certain visionary objections of Choundhree Burgulia the Teekadar of Chorguliya, keeps to the forest, close under the mountains: it cannot be traversed after March, as the Goths, which furnish the necessary guides, are then deserted; and even in March it is desirable to travel by night and by moonlight: the heat in the day time is very great, and such is the intricacy of the forest, and the narrowness of the path, that one cannot well get on beyond a walk. There is a direct path under the mountains from Jam viâ Dhaktuliya to Joulasal. Near Jam occurs a very beautiful and exceedingly bushy *Acacia* called *Bhes* either *dumosa* or *latronum*; and on the Dewa we first meet a large scandent *Dalbergia* probably *D. volubilis*; it is called *Bhuteea*, and becomes more and more common as we advance to the East. In swampy places the *Randia uliginosa*, a handsome shrub, abounds; it is called "Pindara," "Pindaloo," and yields an edible fruit when cooked.

March 10th.—To Joulasal, called 7 coss, about 10 miles, East: crossing the Dewa, passed a large Goth called Kulluga, 964 feet above Calcutta: here the path again abuts on the mountains, and skirts them to Hathgar, another large Goth about half way to Joulasal, behind which the mountains recede in a beautiful bay. These are mere stations of shepherds and wood-cutters; there is not a vestige of cultivation between Chorguliya and the vicinity of Burm Deo. The second half of the route is through still denser forest than the first, composed of *Sal*, *Dhak*, *Huldo*, *Saj*, *Jamun*, *Rai-jamun*, *Amla*, *Bhulio*, *Sahujna*, *Koombh*, *Amultas*, *Rolee*, *Hymenodyction*, *Callicarpa lanata*, ("Ghiwala," "Dera,") *Casearia cheela*, (*cheela*, *cheelara*,) *Hibiscus lampas*: and in several places *Symplocos racemosa*. Near Joulasal, occur *Ficus nitida*, *Trewia nudiflora*, "Toomree," and a tall species of *Globba*, "Soura," "Sara:" growing in swamps. The whole of this tract affords large supplies of timber, bamboos, and grass, which is hereabouts exceedingly high and thick. At the Goths the Babur grass, brought from the hills, is stacked extensively for the dealers from the Plains: the people are also collecting the capsales of the *Rolee* (*Rottlera*) for the red dye they are covered with. This forest stands on a high level, and is intersected by low belts of prairie: contrary to its usual character, the water reaches to within 5 or 6 feet of the surface, and in some places still less. Old *obees* or elephant pits are met, with scattered all over Choubhynsia; and about half way between Hathgar and Jou-

lasal we came on the fresh ones : it was quite light at the time, and the straw, grass, &c., with which they are covered enabled us to avoid them, though placed right in the path, or so closely on each hand as to leave a very narrow ridge between. The owners are Europeans, and have as yet taken but one young elephant this season ; but the chances improve when the herdsmen quit the forest. The obees are now nearly full of water : they are covered with branches and grass, so thinly towards the centre that a dog belonging to one of my people fell in when crossing.

Joulasal consists merely of a clearing spacious enough for the huts of a confederation of some 20 villages from the mountain districts of Dhyanee Rao towards Deo Dhoora : about a mile back the mountains form another beautiful bay like amphitheatre leading into the Doorga Peepul Dhoon, 2155 feet above Calcutta, and 12 miles from Joulasal. There is a route hence to Chumpawut viâ Birgool, and the Sidh ka Dhoora, south of Furka : and another viâ Kooelgaon on the Ludeea, 10 miles on, to Deo Dhoora. The Doorga Peepul Dhoon possesses quantities of Toon timber, which is uncommon in the rest of the Bhabur : it is cultivated with rice, and amongst its morasses rises a considerable branch of the Dewa, which grows by Joulasal on the west. Nanukmutha is called 6 coss south of this.

In the afternoon moved on to Doogola, $1\frac{1}{2}$ or 2 miles by the path, and thinking to effect this without a guide, we lost our way in the dense Sal forest, and wandered twice that distance. Doogola is a small goth at the foot of the mountains on the high eastern bank of a stream which here leaves them, and flows south. There is a route hence to Suniya by Gungapoor, 2 coss : Deea, 2 coss : Bireea-mujhoula, 1 coss : Kheree nikal, 2 coss : Khetul sanda, 1 coss : Nougaoon, $\frac{1}{2}$ coss : Suniya, 1 coss. Suniya is held by the Tharoos, a race who occupy the exterior Turæe, and are said to extend far down to the S. E. The Dewa separates them from the Boksars, a kindred race to the N. W. These people inhabit this "Belt of death" with impunity by observing two precautions ; one is never to be out after sunset during the malarious season ; the other is to raise their houses on piles, after the manner of the Indo-chinese nations. It seems extremely probable that with this proviso and small grass bungdows and sheds raised 12 or 15 feet about the soil, Europeans and natives of India might pass the Turæe or the

swamps of Guinea, with perfect safety at the worst season. From this custom of the Tharoos, and a few strange words, as "Koron" for the Sal tree, I supposed these people might be of the Mongolean species, but they assert themselves to be Rajpoots from Hustinapoor, who fled in battle, and hence the nickname Tharoos "Quakers" from thurthurana, to tremble. A Mugur or Goorung Gorkhalee will equally assert his Rajpoot origin; a descent which is at once disproved by his Tartarian face.

Near Doogola first occurred the "Beejesar" a species of Pterocarpus, probably marsupium; like several instances already alluded to, it becomes more abundant as we advance eastward: the wood is in much requisition for making *dholuks*, &c., the wood-cutters affirm that it does not grow to the westward. It is No. 77 of Dr. Royle's catalogue, Journal, Oct. 1832, and the name perhaps comes from *veej*, marrow, *kshur*, to ooze, or *sar* essence, in allusion to the copious resin which exudes from the bark on wounding it.

(To be concluded in the next No.)

two formerly described, having the under-parts much lighter ferruginous than in the one, and considerably darker than in the other.

5. *Sc. Berdmorei*, nobis, n. s. Nearly one half larger than *Sc. palmarum*: the prevalent colour grizzled black and golden fulvous, with an obscure pale central dorsal streak, flanked by a blackish band: this again by a conspicuous yellowish-white line from the shoulder to the croup; then blackish again, with a second lateral whitish band; below again dusky; and the under-parts yellowish-white, passing to ferruginous towards the vent and underneath the tail. Head tinged with ferruginous: and from what remains of the base of the tail in the specimen, this would seem to resemble in colouring that of *Sc. Layardi*. Length of hind-foot from heel to tip of claws $1\frac{1}{2}$ in. Rodentia tusks deep orange-brown. This species, according to information received from Mr. D. F. Lonsdale, inhabits the Thoungyeen district.

6. *Sc. Barbei*, nobis (XVI, 875). Common in Mergui.

There are no *Sciuri* more difficult to understand than the group exemplified by *Sc. modestus*, Muller, *Sc. lokriah* and *Sc. lokroides*, Hodgson, *Sc. griseopectus*, nobis (XVI, 873), and of which *Sc. chrysonotus* is one of the species best distinguished from the rest. Three specimens lately purchased with a collection formed at Darjiling, differ from all other examples of *Sc. lokroides* which I had previously seen from that and other localities, in having the thighs externally of a bright ferruginous colour: in other respects they are quite similar to ordinary individuals of the species.

N. B. The specimen presented by the Batavian Society and described as *Sc. javensis*, Schreber, var., in *J. A. S.* XVI, 871, is *Sc. ephippium*, Muller, from Borneo.

Supplementary Notes to "The Turæe and Outer Mountains of Kumaon;" Journal of Asiatic Society, Bengal, May and June, 1848.—
By Major E. MADDEN, Bengal Artillery.

The following corrections of, and additions to, the Floxa of the notes referred to, are the result of subsequent visits by Lieutenant B. Strachey and myself to the localities specified; as well as of an examination of

the whole of the plants collected, by Mr. M. P. Edgeworth, to whose assistance I am indebted for the original catalogue in the majority of cases, and for his determination of those where alteration is requisite in the present. The completion of the lists is so far interesting as, to the best of my knowledge, they are the first, exhibiting at one view, the grouping of the plants to be found at any given position in these mountains.

At the end will be found an attempt to identify the plants described, but frequently not named by the late Major-General Hardwick, in his tour from Hurdwar to Sreenugur in Gurhwal, in the year 1796, as detailed in the sixth volume of the Asiatic Researches. The General's route did not conduct him by any means over a tract botanically rich, while he omits many plants which must have occurred; but the paper may be interesting to the Asiatic Society, as tending to elucidate the work of one of its original members, and probably the earliest labourer in the field of Himalayan Botany, as it is to the writer, from the circumstance that the Major-General was his first commanding officer.

Jiaree, p. 352. Kunthagaon, p. 590. The shrub here inserted as *Desmodium?* is *Rhynchosia pseudo-cajan*, (Decaisne,) known in Gurhwal as "Bun-tour," of which the specific name is a translation.

P. 355. The shrub here called *Gouania leptostachya?* is, I doubt not, Dr. Wallich's *G. nepalensis*, and appears to have been first noticed by General Hardwick near Hurdwar, where, as indeed all along the mountains, this common *G. leptostachya* is abundant in the Kotah Doon, and generally at the base of the mountains, and in the exterior vallies, down to Burmdeo: it is known by the same name (Kala-lug, the black climber) as *Berchemia floribunda*, which it resembles a good deal in habit.

Carissa diffusa, (not *Carandas*,) very abundant on all the outer mountains and along their base.

Nynee Tal, pp. 364—372—Add—

Ulmus virgata.

Heracleum.

Sanicula elata.

Torilis elata.

Bupleurum marginatum.

Reutera acuminata.

Cortia elata.

Ptychotis anethifolia.

Acronema tenerum (Edgeworth), on oaks at 8700 feet, Cheenur, where also is to be found abundance of a large plant of this order, not identified.

Ilex odorata : (Don's *Prodromus*) is the species inserted at p. 365, as Dr. Royle's *T. serrata* : both names are suitable. The tree occurs on the descent to Kaleedhoongee near Sirmouria village, as well as on the route from Cheenur to Kotah ; also near Deghat in Gurhwal : and Mr. Edgeworth has observed it near Simlah ; the identification with Dr. Royle's *T. serrata* is, therefore, probably correct. It is a large and very beautiful species, growing at from 3000 to 4000 feet above the sea, and is known in Kumaon as Gurshoon and Gurkoula, where the prefix *gur*, denoting *glen*, points out its usual site.

Cardamine impatiens.

Arabis, Sp.

Potentilla Wallichiana, and another, not determined.

**Rubus lasiocarpus*, *biflorus*, *asper*, *hypargyrus* and *racemosus*?
Roxb.

Cotoneaster bacillaris, (not *affinis*.) "Rous," "Roces."

Limonia laureola. M. Decaisne, who has made a new genus (*Anquetilia*) of this, and removed it to the order *Xanthoxyleæ*, describes the fruit as being 1 seeded. Such is sometimes the case, but it is very generally 2 seeded. The young drupes or berries are even very commonly 3 seeded ; and in each case distinctly 2 to 3 celled, with the stigma 2 to 3 lobed, accordingly want of mature fruit prevents examination as to whether these cells are permanent, beyond the month of June : but certainly 2 at least of the seeds are so ; and from the fruit

* *Rubus lasiocarpus* is the *R. roseiflorus* of Roxburgh, an identification which escaped Messrs. Wight and Arnott, who have only given his *albescens* and *racemosus* as synonymes. The latter seems doubtful, for *R. lasiocarpus* has a corymb, not a raceme. By *R. racemosus*, I mean a procumbent species, differing from *lasiocarpus* by its being racemose, by the leaves not being tomentose below, and by its trailing, nor erect habit. The flowers and fruit are similar : the former (red) : the latter black, and very woolly. The shrub is common in the woods from 6500 to 8000 feet, and is perhaps *R. micranthus* of Don. *R. hypargyrus* is found on the crest of Cheenur, also with red flowers and woolly fruit : but yellow, not black.

in June, it is clear that the 1st seeded berry is produced by the suppression in some cases of the second seed and cell. The third cell and its seed are probably always abortive. The shrub is abundant where I write, (Binsur mountain,) attaining sometimes a height of eight feet. Its habit of flowering both in spring and autumn resembles that of Citrus, near which Dr. Lindley still keeps it; but the persistent calyx, and leaves not articulated with the petiole, are at variance with his character of the Aurantiacæ; as the cells, with apparently only one ovule, are with that of Xanthoxyleæ. The plant is, or recently was growing in the Botanic Garden, Glasnevin. Its range at Nynce Tal is from 6600 to 8600 feet.

Xanthoxylon oxyphyllum. On Luriya Kanta, and observed by Mr. Edgeworth on the ascent from Koorpaka. It comes very near *Brucea Sumatrana*, as defined and described by Roxburgh, and may be the *B. nepalensis* mentioned in J. A. S. April 1833.

Rhus velutina.

Machilus odoratissimus.

Daphnidium pulcherrimum.

Litsæa consimiles. "Cheerura," and "Chírchíra" of upper Kumaon and Gurhwal, where a coarse oil is expressed from the fruit.

Albizia wightii (and elsewhere; not *Acacia mollis*.)

Indigofera polyphylla, "Moos-Sukena," a half procumbent shrub, common from 5500 to 8500 feet.

Indigofera pulchella. At the elevation of 7500 feet, as well as in the outer portion of the Bhabur forest, this is equally reduced to the height of a few inches. But in the Sal forests at 2000 feet and upwards, it gradually increases from a shrub of 3 to one of 12 feet; under the former aspect it appears to be Dr. Royle's *T. Arghawan*. The number of arborescent *Indigoferas* has probably been exaggerated. Roxburgh's *T. arborea* and *virgata*, seem to be *T. Dosua* of Don, and *heterantha* of Wallich. In the vallies of Kumaon, about Almorah and Someour, at 4000 to 7000 feet, there is a shrubby species with short sericeous legumes, and small flowers, which appears different from *T. Dosua*, and may be *I. violacea*, but Mr. Edgeworth pronounced it to be *T. Dosua*. Roxburgh's description of the shrubby species of this genus are indifferent.

Desmodium sulcatum (Edgeworth), and two undescribed species.

Podolotus Hosackioides.

Crotolaria anthylloides, to 8000 feet.

Lespedeza elegans.

Flemingia, (*bracteata*, Roxb. nearly,) a procumbent shrub with simple leaves and *Dicerma*, like inflorescence: flowers white, streaked with pink: everywhere at 6000—8000 feet on sunny exposures, from the Sutlege to the Kalsee.

Flemingia procumbens. Procumbent, with deep red flowers and tuberous edible roots, very common from 5500 to 8500 feet; also Simlah, Kussowlee, Mussooree.

Shuteria involucrata.

Phaseolus scaber.

Vicia tenera.

Pachyrhizus angulatus? Procumbent, twining, with pink flowers, and large tuberous root.

Trigonella gracilis. This plant, with *Argyrolobium roseum* and (*cytisus*) *flaccidum*, is everywhere at Nynce Tal in the rainy season, apparently limited to the limestone rock: at least all three disappear the moment we reach the greenstone of the Gagur, with identical elevation and exposure, &c. *Thymus serpyllum*, on the contrary, does not here make its appearance till we have left both these rocks, and entered the micaceous slate district at Ramgur.

Androsace sarmentosa (not *lanuginosa*, which is not found under 10,000 or 11,000 feet.)

Androsace rotundifolia. Hardwick, *pink*.

Lysimachia debilis and *alternifolia*.

Sedum multicaule, *pauciflorum* and *rosulatum* (Edgeworth, not *pyriforme*.)

Tillæa pentandra, to 8000 feet.

Saxifraga Brunonis covers the crags of Cheenur, facing the lake, from 7000 to 8000 feet.

Drosera peltata (*lanata*, auct.) a New Holland plant. Don.

Astilbe rivularis. Abundant in the northern glens of Cheenur, &c., and as low as 5500 feet at Shamkhet. This plant, which resembles *Spiræa Aruncus*, oscillates between the Saxifrageous and Rosaceous orders, and both in Royle's Illustrations (203, 226) and Don's Prodrum, does duty in each *cohort*, being *Spiræa triternata* of Wallich, S.

barbata of Decaisne, and *S. Aruncus* of Don, who had previously described it at full length under *Astilbe rivularis*.

Clematis grata, not common at Nynce Tal.

Clematis amplexicaulis, Edgeworth, 7000—8500 feet.

Clematis Nepalensis, south face of Sher-ka Danda, also at Murora, on the Nyar in Gurhwal; always in or by running water, between 6000 and 6500 feet above the sea. On the young flowerless shoots, the leaves are triternate; such variations are not uncommon in this genus, and have perhaps augmented the number of species in books beyond that in nature.

Aquilegia pubiflora (not pubescens.)

Pæonia Emodi. In beds of many hundred plants before me at Binsur, not above one in ten flowers has two carpels, a number common in the interior. The plant does not, to my knowledge, extend further N. W. than Dhunpoor mountain, one of the sources of the Nyar. In that and the neighbouring districts the young shoots are eaten as a vegetable under the name "Soojoonia," though the plant is called Chundra; it is probable that the long tuberous roots may be one of the species of *Bikk*.

Epilobium montanum, *cylicum*, and *laxum*?

Circæa repens and *intermedia*.

Berberis Wallichiana? summit of Cheenur only, 8700 feet.

Berberis asiatica. Kilmora: to 7500 feet, as on Binsur and Siyabe Devee.

Vitis tomentosa, *rugosa*, on Sher-ka Danda.

Aralia or *Panax*. Shrubby, and probably undescribed.

Millingtonia (*Meliosma*) *Dillenifolia*. Luriya kanta.

Polygala triphylla and *crotelarioides*.

Stephania Wightii, common at 6500—7500.

Bryonia umbellata.

Trichosanthes palmata. Outlet of the lake, 6400. Perhaps its upper limit.

Hypericum cernuum, *Uralum*, *barbatum*, *elodeoides*.

Acer villosum (and on Binsur: a beautiful species.)

Rhododendron arboreum, (*puniceum*, Roxburgh.) Captain A. Gerard, account of Koonawur, says, that the tree with 'large red flower' ascends to 10,000 feet: but in Kumaon and S. E. Gurhwal, we only

find the variety? *floribus roseis* at this elevation, and up to 11,300; as determined by Lieut. Strachey. It is only while young that the leaves, and still more the leaf-buds and scales of the scarlet *Rhododendron* are poisonous; the flowers are certainly intoxicating, if eaten in any quantity, as I have seen exemplified in my own coolies.

Linum trigynum.

Phyllanthus (*Leptopus*, Decaisne) *cordifolius.*

Phyllanthus parvifolius, Don.

Euphorbia hirsuta (not *involucrata*.) probably *E. longifolia* of Don's *Prodromus*. A pretty species, resembling the English wood spurge.

Euphorbia (*peplodes*.)

Schizotechium crispatum.

Leucostemma latifolium.

Stellaria media.

Cerastium triviale.

Mollugo stricta.

• *Hedyotis calycina.*

Randia (*Gardenia*) *tetrasperma.*

Galium asperuloide, Edgeworth. Descends to 7500. It has the appearance and fragrance of *Asperula odorata*, but differs in the leaves from Mr. Edgeworth's species.

Galium aparine, common in cultivation, hills and plains, from the Ganges to Nynee Tal and Almorah.

Viburnum cylindricum, probably Dr. Royle's "*punctatum*." "*Kala Tit-muliya*." This shrub is an evergreen, and is common from Simlah to Kumaon, from 6000 to 8000 feet, as are *V. cotinifolium* and *mullaha*. Of these *V. cotinifolium* is identified by Dr. Royle with Wallich's *polycarpum*; and *mullaha* with *stellulatum*. The nature of the plants would lead to a suspicion that the synonymes have been reversed, *V. cotinifolium* being remarkable for its stellate pubescence, as *V. mullaha* is for its abundant fruit: (red.) It preserves the Nepalese name to Kumaon, (*Muliya*, and *Tit-muliya*, from the bitter fruit) and even to Mussooree, (*Maloo*;) but at Simla this is lost, and replaced by *Eree*. *V. cotinifolium* is known as *Jawa* at Simlah, *Gooya* in Kumaon; it has black fruit, and much resembles *V. lantana*. *V. nervosum* of Don's *Prodromus* is identical with his *cotinifolium*; *V. nervosum* of Royle is the *V. foetens* of Decaisne, an epithet for which it is indebted to the odour of its leaves when

crushed; the flowers however, have a delicious fragrance of lemon. It abounds everywhere from 9000 to 11,000 feet, the "Thelain" of Busehur, but in Kumaon "Gooya." *V. grandiflorum* was found common on the upper Surjoo by Lieut. Strachey, with the habit of *V. mullaha*: where also occurs another species, perhaps *punctatum* or *adenophyllum* of Wallich; growing to be a considerable tree.

Daphne papyracea, Wallich, *D. Bholua*, Don, formerly inserted as *D. cannabina* on the authority of the former in the Asiatic Researches, unless the shrub there described be *D. odora*, which seems to differ little from the present except in being fragrant. Two varieties are common everywhere in the British Himalaya; one with white flowers and yellow fruit, is found from 4000 to 8000 feet; the other with purple flowers and fruit from 7000 to 8000. "The Nepal names Bhuloo-soang and Bholua, if Hindee, and the aspirate be correct, would indicate its poisonous property; without the aspirate, the strength of its fibre: *Sida rhomboidea* is called Buloo for this reason. But the orthography in Kumaon is "Buroowa," with the prefix, *set*, white; "Sutpoora" in Gurhwal. No allusion to the plant or its uses is to be found in Dr. Wilson's Dictionary; but the Almorah Pundits affirm that it is intended in the Umurkosh by the terms Loota, Tuntoovaya, Oornunabhu, and Murkutka, all denoting a spider, weaver, &c., and, as applied to this *Daphne*, alluding to the manufacture of paper from the bark.

Daphne sericea; Don's Prodrômus; an examination of many living specimens satisfies me that this includes *Wickstroemia salicifolia* of Decaisne, and *W. canescens* of Meisner; the differences are merely in degree, due to age and exposure, and may either be found on the same plant, or on plants within a few yards of each other, and evidently of the same stock. Paper prepared from this—the *Chumlia*, is considered inferior to that of the *Set Buroowa*, allowing the ink to run. The bark makes a strong rope, and is so used at Nynce Tal.

Osyris Nepalensis. Descends from 7000 to 1200 feet along the foot of the mountains; none of the people about Almorah are aware of its leaves being used for tea.

Geranium bicolor, Royle, *Ocellatum*, Decaisne; from 1500 to 7000 feet.

Impatiens umbrosa and *tricornis*.

Evonymus echinata, a shrub climbing like ivy over trees and damp-shaded rocks, tetramerous.

Urtica (*Girardinia*) *heterophylla*, to 7500 feet.

Urtica parviflora.

Urtica Goglada.

Pouzolzia (*Urtica*) *hispida*.

Cannabis sativa.

Boehmeria salicifolia.

Procris—several species.

Ficus laurifolia.

Ficus saxatilis? a creeping, rooting species, on trees, rocks and banks, to 8000 feet.

Myrica sapida.

Salix tetrasperma, "Gur-by-nsh." Grows well along the margin of the lake, but scarcely indigenous, as it appears to flower with difficulty, and is here about a thousand feet above its usual limit elsewhere in the province.

Salix leucomelas, Cheenur. Forms dense thickets, from 8000 to 10,000 feet. Common at Fagoo, Huttoo, &c.

Callitriche verna.

Elæagnus parvifolia? Gheewaeen.

Aristolochia (*Saccata*?) 6500—8000 feet; Sher and Boorans ka Danda, common on Binsur, the Gagur Pass, &c.

Rumex nepalensis and *hastatus*, the last to 8500 feet.

Pupalia squax.

Achyranthes, a large white-flowering species; undescribed.

Polygonum sinense, *ptero-carpum*, *herniarcoides*: the last as high as 7500 feet.

Plantago asiatica.

Viola aspera and *Patrinii* (*cæspitosa*, Don.)

Craniotome versicolor.

Micromeria biflora.

Leonurus pubescens (not *Sibiricus*.)

* *Scutellaria scandens*. From 4000 to 8000 feet, a species utterly mis-

* In the original paper it is twice, (pp. 369, 435,) mentioned that *Melissa flava* grows on Binsur. This is a mistake; the plant intended is a *Nepeta*, probably *N. elata*, Royle. It also occurs on Cheenur at Nynce Tal, and is remarkable from the

named, being in no degree scandent, though Don asks "an potius volubilis!" Mr. Benthams name, "angulosa," is very appropriate and should be substituted. So *S. repens* is an erect shrub, and requires an epithet expressive of its numerous stems and branches. Many Himalayan plants bear evidence that they were named by persons who never saw them. *Rosa macrophylla*, for example, has not large leaves; they are much smaller than those of the common *R. Brunonis*.

Begonia tenella, (not *dioica*.)

Clerodendron foetidum.

Phryma leptostachya, common in woods.

Mazus surculosus.

Vandellia nummularifia.

Veronica biloba and *Maddenii* (n. s. Edgeworth.)

Torenia cordifolia.

Datura alba.

Solanum rubrum.

Goldfussia pentstemonoides.

Erigeron semibarbatum.

Erigeron Roylei, "Murchmool." (Not *Aster bellidifolia*.)

Inula nitida.

Conyza veronicæfolia.

Diplostephium Roylei.

Carpesium pubescens.

Oreoseris gossypina, from 1500 to 8000 feet, (not *Onoseris lanuginosa*.)

Senecio rufinervis, (not *canescens*.)

Senecio spectabilis, (not *Jacobæa*.)

Senecio alata, on Cheenur, but rare.

Amphirapis cuspidata.

Amphirapis pubescens. (*Solidago nepalensis*, Don.)

Echenais ferox, probably the *Cnicus verutus* of Don. It grows from 4500 to 7500 feet, and is found up to Paoree in Gurhwal, and probably much further. If it is Don's plant, it also inhabits Nepal "ad Narainhetty," a spot in the vicinity of Kathmandoo, where per-

flowers opening yellow in the morning but becoming light blue by the afternoon; an example of natural Daguerreotype.

haps from some error in the labelling of Dr. Hamilton's Herbarium, the *Prodromus* exhibits the most incongruous assemblage of plants.

Plotaxis carthamoides, a very bitter plant, probably *A. scaposa* of Mr. Edgeworth, *Serratula carthamoides*, Roxb. and *Cnicus heteromallus* of Don.

Serratula pallida. *Centaurea lanata*, Roxb. III. 444, seems to be a Calcutta edition of this.

Dicrocephala gracilis.

Blainvillea latifolia.

Sonchus arvensis.

Melanoseris cyaneus, (not *Mulgedium robustum*.) It is occasionally *white*.

Dipsacus inermis β , Wallich, *mitis*, Don, is abundant everywhere from 5000 feet, (Almorah,) to above 8700 (Cheenur), while *D. inermis*, α , Wallich, *strictus*, Don, occurs at Kathmandoo (4500), Koorpaka, (5000) and on Cheenur at 8000, but I consider it merely a variety of the first, as every gradation in the number of lobes to the leaf, and every variation in the number of ridges to the stem may be observed in these supposed species. Under this view, the plant affords a striking instance of depression in its habitat as we travel to the S. E., barely occurring at 8000 feet, Simlah, but at 4500 or thereabouts, in Nepal, according to Dr. Wallich.

Valeriana elata.

Gentiana capitata and *pedicellata*. *G. Kurroo*, so common on the limestone crags of Mussooree, has not hitherto occurred here.

Ophelia (*Agathotes*) *cherayita*. The tetramerous, purple-flowered variety (with a tendency, however, to greenish-yellow) mentioned by Dr. Royle, occurs from 7000 to 9000 feet, in shady woods with northern aspect, on Cheenur, Binsur, Gagur Pass, Mussooree, Simlah, and Nagkunda; and though called by Dr. Lindley, "a Himalayan annual," is in truth, the only perennial *cherayita* with which I am acquainted. The stem is sometimes five feet high, and much branched; the root long, forked, and pale yellow; the root-leaves, petioled, and resembling those of *Plantago*; the whole exceedingly bitter; but the plant is not very abundant; and it is probable that the annual species, *purpurascens*, *cordata*, *alata*, *angustifolia*, &c., supply the chief portion of what is exported to the plains.

Campanula cana, (not *ramulosa*.)

Cynanchum glaucum and *Dalhousiæ*.

Tylophora tenerrima? amongst grass, Sher-ka Dauda, *Gardneria ovata* (or new species.) Haneë Baneë rocks; also abundantly on Binsur and the northern slope of the Gagur Pass.

Pardanthus Sinensis.

Juncus glaucus and *concinus*, (not *elegans*.)

Smilax Villandia, *maculata*, and *vaginata*, the last on Cheenur; on Binsur at 7300.

Allium Wallichianum, (not *lilacinum*.)

Murdannia scapiflora, (v. *Aneilema longifolia*?)

Dioscorea sagittata and *deltoides*.

Arisæma speciosa. Luriya Ranta. Several other species undetermined.

**Remusatia (capillifera*, provisionally. M. P. E.) Probably Don's *Caladium pumilum*. "Banj ka pindaloo," i. e. *oak colocasia*, common on trees and mossy rocks from 5—6000 to 8—9000 feet. At p. 438, it is confounded with *R. vivipara*, which however is quite distinct, and does not appear to ascend above 4500 feet, as Bheem Tal and Noukoochia Tal, where it is known as "Bagh ka pindaloo," i. e. Tiger's *Colocasia*.

Cephalanthera acuminata. White wood Orchis, May.

Lycopodium tenellum and —.

Gymnogramme vestita. Top of Deoputa.

Dactylis glomerata.

Ischæmum speciosum, a strong and tall reed-like grass, in abundance under trees, north face of Cheenur, &c., from 7000 to 8,700 feet.

Arundinaria falcata, "Ningala," not *Vingala*, p. 371. The people

* The opinion is general amongst the people of Kumaon that this plant never flowers; and the majority do not, as is common with plants reproduced by bulbs, &c. These appear in September on radical procumbent panicles, (not erect spikes as in *R. vivipara*,) and the scales each ending in a long white spirally twisted awn give the whole the appearance of a tangled mass of thread. The flowers appear in June, a little before the rains set in, and before the leaves expand, and as the spikes are only 2 or 3 inches high, and soon curve down amongst the moss, &c., are easily overlooked, though the spathe is of rather a bright yellow; much like that of a small *Aram* with pedate leaves common at Simlah, and as far up as Cheseet in Kunawar.

of Danpoor Pergunna, in the north of Kumaon, enumerate no less than eight kinds of Ningala, or Ringal, as it is pronounced in Gurhwal, viz., 1. Tham ; 2. Utham ; 3. Kutino ; 4. Malingo ; 5. Jhoomro or Jhoongra ; 6. Deo Ningala ; 7. Gor Ningala ; 8. Doom Ningala. The last is probably the common, or Kalee Ningala, found abundantly on the Gagur range, and, like the Jhoomro, in much request for pens. My friend Dr. Falconer refers it to a new genus, *Thamnocalamus*. No. 1, is said to be the largest of the whole, and is sent down to the plains for hookkah pipes ; but I have never noticed it, or any but the last three. No. 6, is the *Arundinaria utilissima* of Mr. Edgeworth, and occurs in great abundance near the snowy range : making excellent mats, baskets, fishing-rods, &c. No. 7, I met with all along the Undretee river below Rol in Busehur, (there called *Gol*) with thin culms 18 feet high, in dense clumps of a hundred or more to each.

The tree entered at p. 372, *Gyrandra laurina* is that which Dr. Royle alludes to, p. 261, under *Ilicinæ*. It rather belongs to *Flacourtiaceæ*, Mr. Edgeworth informs me, as well as that the name *Gyrandra* has been previously appropriated to one of the *Gentianæ*.

To the lake plants enumerated at p. 358 are to be added—

Miriophyllum tuberculatum.

Potamogeton crispum, pectinatum, parfoliatum.

These and the other Himalayan species of this genus are all identical, Mr. Edgeworth informs me, with those of Europe ; the presence, therefore, of *Polygonum amphibium* in Nynee Tal, becomes less anomalous ; and considering the number of aquatic birds which frequent the lake, Gmelin's theory of diffusion by their agency does not seem an unlikely solution of the problem as to how these plants came here.

The following memorandum by Lieutenant Strachey, which reached me too late for insertion in the original paper, may be best introduced here ; the elevation of localities at Nynee Tal being those chiefly affected.

“The heights of places in Kumaon, given on my authority in Major Madden's paper on ‘The Turæe and Outer Mountains of Kumaon,’ are to be considered as mere approximations to the truth. Those at Nynee Tal and its immediate vicinity, are, I think, generally 200 feet too little. They were calculated on the assumption that the water of the lake was 6200 feet above Calcutta, whereas there is every reason to suppose that the true elevation is nearly 6400 feet.”

6409 is Lieutenant Strachey's determination, which will give for

Cheenur,.....	8732	
Cheenur (or Deoputa) ka Khan,	7623	
Uyarpata,	7908	
Luriya Kanta, S. W. peak,	8169	
" " highest,	8200	
Kotah Bagheechu,.....	2269	(2269)
Gagur Pass,	7200	
Ramgar Bungalow,.....	5945	
" Bridge,.....	4884	
Pecoorah Bungalow,	5644	
Almorah station (Mr. J. Strachey's House),	5586	
Birond Peak, p. 394,.....	7052	(Trigonometrical Survey.)
Kaleedhoongee,	1370	
Huldwanee Mundee,	1549	

From the Bumouree or Káth-godam bungalow, at the base of the mountains, 1809 above the sea, to the southern limit of the Huldwanee cultivation, a distance of 6 miles, the fall was determined by Captain Jones of the Engineers to be 360 feet; it continues at such a rate that Rampoor is only 547, Moradabad 674 feet, and Bareilly 470 feet above the sea: such is the glacis in front of the vast bastions of the Himalaya.*

* The heights of several places in Kalee Kumaon inserted chiefly on the authority of Dr. McClelland's map are generally several hundred feet too much; the following, from barometrical observations, by Mr. John Strachey, are very near the truth.

	<i>Feet.</i>
Bylchheena Pass,	3709
Belkhet,	1525
Chhirapanee,	6454
Kanadeo,	7241
Jhoom (Sooe),.....	7105
Dhurgura (Thermometer H. S.)	4500
Kunthagaon (ditto)	3900
Puyapanee,.....	7049
Dol Bungalow (Thermometer H. S.)	5438

Between Nynee Tal* and Kalaputhur, pp. 373—375, Add—
Cucumis Hardwickii, up to Koorpaka.

Leca aspera.

Hedera terebinthacea.

Ruta albiflora : descends to 3000 feet, near Kalaputhur, to 4000 at Bheem Tal; but in the drier region of Almorah not below 5000.

Coriarea Nepalensis, from 2000 to 7600. Dr. Royle gives the lower limit about Mussooree as 5000.

Sageretea oppositifolia.

Impatiens balsamina : 4000 to 5500.

Ilex odorata.

Polygala oligophylla, at 2500.

Desmodium Gangeticum.

Argyrolobium roseum, from 2500 to 7500. Very common.

Rumex Wallichianus. Base of mountains.

Rungia parviflora.

Peristrophe speciosa.

Lepidagathis ———.

Porana racemosa.

Periploca (Streptocaulon) calophylla.

Loranthus scurrula, W. and A.

Plectranthus rugosus. To 6500.

Salvia plebeia.

Ajuga remota, (lobata? Don) common along the base of the mountains.

Verbena officinalis.

Lantana dubia, quite common from the forests of the Bhabur to about 3500 feet an undoubted native.

Gynura nepalensis.

Blumea alata.

Conyza polyccephala. (Edgeworth.) To Hardwar.

Sonchus arvensis. To Kalaputthur.

Youngia runcinata.

Aplotaxis eirsioidea, common in cultivation to 3000 feet. *Cardus lanata*. Roxb.?

Sauromatum punctatum.

* To the vegetation of Nynee Tal add *Urtica scripta*, Don.

Sagenia coadunata.

Below Kaleedhoongee, *Calotropis Hamiltonii*, which I had not noticed, was found by Mr. Edgeworth, but *C. gigantea* is by far the most common: at Hurdwar, 80 or 90 miles, N. W. the former is the only species.

Acacia "Kureo," of p. 374, appears to be *A. elata*.

Kotah Doon, p. 379.

Ficus cordifolia? "Gujeeoon." Known in Gurhwal as the "Kabur;" it is I think, the tree called Peepul in Goojrat, where *F. religiosa* is "Peepa." The Gujeeoon may be *F. Tsiela*, Roxburgh's next species to *cordifolia*.

Pterospermum suberifolium. "Moochkoonda." At Gintee village, but no doubt an exotic.

Elæagnus conferta.

Zeuxine sulcata.

Plectranthus Coetsa. To 2200 feet at Kotah, and also in the Dehra Doon, by water courses; it differs somewhat from the normal form, usual at 4000—8000 feet; but less so than the plant which we find at 11,000, which is pronounced identical. The wild goat is very fond of this last variety.

Thalictrum foliolosum.

Trochostigma. A large semi-scandent shrub occurs in the forests along the base of the mountains in this neighbourhood, as well as along the whole line from Rikhikes on the Ganges to Burmdeo on the Kalee, and up the Surjoo to Kupkot. Flowers in May.

Tetranthera monopetala. "Kutmura." "Singrow."

Harina oblongifolia. The Buliya Glen above Bumouree is *not* its N. W. limit; Lieutenant Strachey obtained specimens between Kotah and Nynee Tal; and I have myself since found it growing luxuriantly in Gurhwal on the Aonla Boonga Pass, between the Patlee Doon and Kala-khan on the Ramgunga. The people there (few and far between) did not know the plant, nor did it occur onwards in the Hurdwar direction; the Patlee Doon may therefore be safely considered its boundary. *Symplocos racemosa* reaches to within a few miles of Hurdwar.

Abrus, p. 381. This species also grows on the hills east of the Patlee Doon, and below Bheental, but sparingly in both localities.

Polgurh (properly Puwulgurh) p. 376.

Medicago hystrix.

Buchanania latifolia.

Schrebera Swietenioides. "Moka." This tree occurs near Polgurh in considerable numbers, scattered in the Sal forest which clothes the high southern bank of the Dubka; a small hamlet below is named Mokanee from it. Lieutenant Strachey discovered the tree in this locality; I had previously met one or two in the Dhikolee Pass, but, wanting flowers and fruit, could only conjecture it to be a *Bignonia*, of which, and *Swietenia* (Mahogany) it has entirely the habit. It has not occurred elsewhere, and being tomentose, may possibly be different from Roxburgh's species; but Mr. Edgeworth informs me that the foliage, &c., is similarly clothed in Bundelkhund; where it is called *Ghant*. The Kumaon name is used in the Peninsula, and is evidently derived from the classical *moksh*, *moovku*, in allusion to the *pendulous* fruit, as the synonymes *Ghunta-patulee* and *Ghunta-parulee* (*Bell-Bignonia suaveolens*) refer to its form; and *Kshardroo* to the *ashy* color of the fruit and bark. Dr. Wilson does not give any identification of these terms; nor does Dr. Lindley notice Roxburgh's genus.

Seetabun, p. 383.

Crotolaria neglecta. To Rikhikes in the Dehra Doon.

Trewia nudiflora, common in the Dehra Doon.

Sabia paniculata. Sansadhara in ditto.

Scutellaria repens.

Gentiana aprica (*decemfida*, Don.) Damp shady banks.

Mohan, p. 386.

Hemiadelphis polysperma.

Polygonum glabrum and *barbatum*.

Mazus rugosus. To Hurdwar; and to 7400 feet, Binsur.

Nepeta graciliflora, ditto.

Ficus laminosa, Kosilla, Dhikolee Pass, and every similar spot on to the Ganges at Tupoobun.

Chilkiya, p. 388.

Gwatteria Korinti, (at Gybwa.)

Trophis aspera, "Roosa"

Rubus distans.

In the market here, the fronds of *Adiantum capillus veneris* and

venustum are sold in considerable quantities under the name of *Hurraj* (Toolsee in the hills,) being used as a dye.

At pp. 392, 441, 442, some confusion has crept into the enumeration of some of the species of *Sinapis*, which will be best cleared up by a simple statement of their corrected names.

Sinapis dichotoma, "Juria," "Judia," also "Luhota" and "Lyhta" in the Bhabur; "Kalee-surson" of Northern India.

Sinapis glauca, Roxb. "Rara," "Rada." "Bunga-surson" of Seharunpoor and the Dehrah Doon. "Peela, Peora (i. e., yellow and red Surson, and often "Surson" simply, of Oude and Rohilkhund. The Kumaon plant is exceedingly like *Brassica Napus*, grown from European seed.

Sinapis glauca. Royle, and Edgeworth, account of protected Sikh States: not noticed in the *Flora Indica*. "Dyn," "Daen," "Lae" of Kumaon and Gurhwal: sometimes "Khetiya," "Toree" and "Toria," (s. *twria*, pungent) of northern India, where this variety or species is in general cultivation, including the Himalaya up to the villages of Joohar, at 11,000 feet elevation.

The "Teera" from Benares, p. 392, is the "Rae" and "Mukura Rae" of p. 442; its specific name is still unknown to me.

Huldwanee, pp. 395—399.

Saccharum Sara or *Munja*. The lower half of the culm is called *sentha* and *serput*; the upper half, *sirkee moonj*; rope is made from the leaf-sheaths. From Sir William Jones' expressions, it would appear that *munja* is simply the culm of *S. sara*: "from the *moonja* or culm of the *Sara* was made the *maunji*, or holy thread, ordered by Menu to form the sacerdotal girdle, in preference even to the cane grass." The plant generally called Moonj is abundant along the banks of the Ganges at Hurdwar, and generally along the base of the mountains and up the vallies to 3500 feet; the brahminical thread called *juneo*, when first worn, is still formed of its fibre: and in connection with the constant use of the culm for arrows, may originally have represented the bowstring. It agrees best with Roxburgh's *S. Munja*, and at Hurdwar and in Gurhwal, is still commonly known by the Sanskrit term *sarkura*,—the origin of *sugar* in every language: the root being *sri*, to hurt. The application is not very clear, till we recollect the resemblance of the sugar-cane to *Saccharum Munja*, and the arrow-

shafts (*sura*) furnished by the latter : the weapon, therefore, preceded the luxury. The Sat or Kilk reed-pen is the culm of *Saccharum fuscum*, not *S. Semidecumbens*.

Arundo? *Khyla*. This reed is very common in Gurhwal, where also it is considered poisonous to cattle, and has the name of "Bichhra."

Imperata cylindrica. "Shiro," ascends to 7500 feet.

Saccolabium papillosum (*Cymbidium præmorsum* of Roxburgh) is the orchid which covers *Ulmus integrifolia*.

Plectranthus ternifolia : common in the grass Bhabur, and up the great vallies to 3500 feet.

Stipularia flaccida, (*Arenaria flaccida* of Roxburgh, who notes its resemblance to *Spergula arvensis*,) is abundant in the rubbee cultivation of the Bhabur.

Albizzia (*Acacia*) *stipulata*; common in the forests of the outer ranges.

Flemingia strobilifera : open forests of the Bhabur.

Sephalica, p. 398. Neither *Vitex* nor *Nyctanthes* supplying the requisite conditions, a final attempt to identify the plant will be admitted. In Ward's View of the Hindoos, Poetry, part 3, Vol. II. 381, we have the following passage in an address to the "Koomoodu, which expands its flowers only in the night." "Thou dost not shew even thy face to the sun, yet thou renoucest not the bee (who lodges in thy bosom all night.')" Here, then, is a fact, real or poetical, involving the etymology of the term in question. Now Roxburgh (II. 577,) has Koomooda as the Sanskrit name of *Nymphœa Lotus* (*pubescens*) with white flowers, but the synonyme *Neelica*, as well as the Umurkosh, quoted by Sir W. Jones, implies that *blue* is the usual color : "When the *Sephalica* has white flowers, it is named *Swetasurasa* and *Bhutavesi*." (*As. Res.* IV. 258.) The probability therefore is that *Nymphœa cyanea* with "flowers beautifully azure," (Sir W. Jones,) or the blue variety of *Nelumbium speciosum* reported to exist in Cashmeer, is the plant originally intended. Sir William explains Koomooda to signify "Delight of the waters," which, though applicable to any beautiful aquatic plant, he would refer to *Menyanthes* (*Villarsia*) *indica*; and we find *M. cristata* with "Koomoodwutee," "Koomoodinee," as its names, in the Flora Indica. The curled petals, and long white filaments of the corolla and nectary of these white-flowering plants, are

exactly such as the mountaineers of the Himalaya still designate by some term compounded of *Bhoot*, a goblin, a spirit : *Bhootkes*, "ghost's hair," being applied to several plants with finely cleft leaves and flowers, or furnished with copious long tomentum. *Swetasurasa* may denote "like a white angel;" but Dr. Wilson says, "White Rasan," *Ophi-oriza mangos*, to which it is compared; a plant I am not acquainted with, nor is it certain that *Rasna* is properly so rendered. The synonyms of the *Umurkosh*, not at present within my reach, might tend to establish this identification; but, right or wrong, *Nyctanthes* is clearly excluded, being never blue: the Kumaon pundits all consider it to be the "*Parijat*," pared down to mundane attributes; in color of flower it comes near the *Villarsias*.

Several trees are to be found in the Sewalik and Bhabur of Gurhwal which have not hitherto been met with in Kumaon.

Such are *Pongamia glabra*, *Boswellia glabra*, *Cochlospermum gossypium*, *Feronia elephantum* and *Limonia crenulata*; the last suddenly makes its appearance in great abundance a few miles S. E. of Laldhang: some of the others would not be recognized, being leafless all the cold weather. *Batis spinosa* (or *aurantiaca*?) the "*Kangoo*" and "*Manda*," of the Dehra Doon, I have not seen S. E. of the Ganges. It has a fruit the size of a small custard-apple, repening in November, and not unlike the *Maclura aurantiaca* or Osage orange; while Roxburgh describes his with fruit the size of a pea. The natives of the plains generally mistake the Doon shrub for *Flacourtia cataphracta*, and call it *Puniyala* and *Puchnala*.

Bheemtal, p. 403, 404.

Urtica (not *Boehmeria*) *frutescens*, "*Poee*," "*Phoosur puta*;" it comes near *Urtica pulcherrima* of Roxburgh, and is common to the Ganges in Lower Gurhwal, where it is called "*Dhoula Kagshee*;" the "*Poosh*" of Nepal and Sikhim (also at p. 587.) *Vide Journal Agri. and Hort. Soc. Bengal*, Vol. VI. p. 135.

Hedera elata? tree of 30 feet, Sat Tal.

Hedera terebinthacea (not *parasitica*: and also p. 352.)

Casearia tomentosa.

Sabia paniculata (not *campanulata*, which has *purple*, not *green* flowers, as represented by Dr. Wallich; it is very common in Kumaon: the drupes when ripe are of an ultra-marine blue.

Biophytum sensitivum, to 3500 feet.

Commelyna Douii.

Uraria lagopus.

Pueraria tuberosa, to 4500.

Wendlandia puberula.

Sapindus acuminatus.

Clematis Gouriana, to 4500.

Adiantum lunulatum.

Dalbergia Ougeinensis. To 5000 feet, and far up the great vallies. The Vernacular Sanun,* Sandun, Sunduni, &c., universally employed in the Bengal Presidency, are from the Sanskrit "Syundun," "Syunduni," "Syundan-droom,"—"tree of the war-chariot," indicating the use formerly made of the timber, which would probably be found an excellent material for the spokes and felloes of wheels, &c. It is still in high estimation in Kumaon, and many parties may be seen returning from their annual visit to the Bhabur with a small supply for their ploughs, &c.

The lake at Bheem Tal is 64 feet deep. (*As. Res. XIII.* 309.)

The following grow in or by it, in addition to those enumerated at p. 406:—

Vallisneria spiralis.

Cenante stolonifera.

* *Balanites Ægyptiaca*. The vernacular names indicate the Sanscrit Hingoo-putree and Hingoo-purnee, "asafoetida leaf." I do not recollect the odour of the leaf, but "the pulp of the fruit has an offensive greasy smell." (Roxburgh.)

One or two more identifications of the vernacular with the classical may be added.

"Talisputra," "Mountain-leaf." A leaf used in medicine (Wilson) is probably *Rhododendron anthopogon*, well known to the mountaineers of Busehur as "Talsir." The leaves are much more aromatic than those of *R. lepidotum*, to which Dr. Royle refers "Taleesfur." "Chora," (*Wilson's Dictionary*.) Traill in *As. Res.* XVII. 9, is the ordinary term in Busehur and Gurhwal for Mr. Edgeworth's *Angelica glauca*; "Gundhrain" in Kumaon, and "Cheepes" of the Bhotias.

"Chumpa" is referred by Dr. Wilson to *Bauhinia variegata*, but is more probably *Michelia Kisopa*, *Doltsopa*, &c. which, with several *Magnolias*, are called Champ in Nepal and Sikhim.

"Toong," *Rottlera tinctoria*, according to Wilson, but in the British Himalaya universally used for *Rhus velutina* and *parviflora*.

Pontedera vaginalis, and at 5700 near Shamkhet.

Potamogeton natans, *perfoliatum*, *pectinatum*.

The plant which is entered *Scirpus lacustris*, grows 10 feet high, flowers in May, and is not to be distinguished from the English Bull-rush.

Shamkhet valley, p. 408. Here at 5500 feet, we have

Thalictrum rupestre.

Michelia kisopa.

Hydrocotyle tenella (*Nepalensis*.)

Jasminum chrysanthemum.

Desmodium polycarpum.

Euphorbia hirsuta.

Potentilla nepalensis and *splendens*.

Rubus rotundifolius (*Goureephul*), and an unknown species allied to it, but very green and glossy; in shade only, to 7300, Gagur Pass, Binsur; affinis provisionally, from its resemblance to *R. Goureephul* and *Wallichianus*.

Agrimonia nepalensis.

Silene inflata.

Geranium Wallichianum.

Cedrela serrata.

Evonymus tingens and *Hamiltoniana*.

Ilex dipyrena.

Viburnum cylindricum.

Sedum multicaule.

Primula denticulata and *speciosa*.

Lysimachia debilis.

Androsace sarmentosa.

Elsholtzia polystachya.

Senecio spectabilis.

Echenais arachnoidea.

} Scarcely under 7000 ft. at Simlah.

Barkhausia aspera, at p. 434, this is erroneously marked N. S.; it is the European plant, and is pretty common in cornfields and waste lands from this level to about 7500.

Tulipa stellata, at Sireenugur in Gurhwal; this plant descends to 1800 feet; the elevation of the Chirapancee Pass, estimated at 7000 feet, p. 578, is exaggerated; the actual height by barometer is 6454.

Gagur Pass, p. 411.

Rubus affinis (Mihi) and another, unknown.

Crassula indica (not *sempervivum*.) Common at Simlah.

Acar lævigatum, common here; also on Binsur, and at Udwanee in Gurhwal.

Viscum verticilliflorum, on *Quercus incana*, to 7500.

Loranthus vestitus.

Hypericum perforatum.

Symplocos nervosa, (probably *S. sumuntia* of Don's *Prodromus*, and *S. lucida* of J. A. S. April 1833.) A small evergreen tree, common on the north side of the Pass, and in similar shady places on Binsur, Boora Pinnath, &c., and Punjok Khal in Gurhwal, from 6000 to 8000 feet. The leaves are beautifully glossy. *S. Loha* grows on Siyahee Devec.

Lysimachia debilis.

Hedyotis Lindleyana.

Gardnera ovata.

Bryum serpyllifolium.

Dolichos glutinosus, (nearly) at 6000 feet.

Ramgur valley, p. 416.

Barleria cristata.

Verbena officinalis. This may be adduced as another instance (p. 356) of an European species limited to the warmer region of the Himalaya, from 2000 to 7000 feet, so far as I have observed it. So we have *Geranium molle* in great abundance, associated with *Acacia Catechu*, at 1200—1500 feet, along the Ganges between Tupoobun and Deopryag, flowering in February.

Deodara Pass, p. 415.

Buddlea crispa, "Doosheria." The shrub so named, common everywhere from Busehur to Kumaon, at 5000 to 7500 feet, appears to be *B. paniculata* of Wallich (*Flora Indica*, I. 412) and Don, (*Prodromus*), *B. tomentosa* of Hamilton.

Salix, an arborescent species is common here between 5500 and 6500 feet, and in many similar shady localities in the province; it is diandrous, polyspermous (often 5,) with lanceolate leaves, glaucous and sericeous beneath. It is probably *S. cuspidata*, Don. *S. tetrasperma* fringes the Ramgur stream fully up to 5000 feet.

Peorah, p. 416.

Viburnum cylindricum.

Disporum Pitsutum, common also on Binsur, Siyahee, Boora Pinnath and Fagoo.

The "Neoula" mentioned at p. 420, is *Bucco grandis*. The story goes that its lamentable cry is the expression of its feelings on the loss of a awsuit! The loud bell-note of another species (*B. caniceps*) is equally remarkable in the forests of the Bhabur. The cause of the Singor (*Athene Brodiei*), and generally of the owl family, making their appearance only by night, is explained in Kumaon by the legend, that having originally none of their own, they dressed themselves in plumes borrowed from all their neighbours; but repudiating this loan, are invariably chased and beaten by these latter whenever they venture abroad in the day time!

Almorah, pp. 423—445.

Clematis gracilis, Edgeworth, at 7500 feet on Binsur.

Diclytra scandens. Found at Bala Jagesur by Lieut. Strachey, at Mussooree by Mr. Edgeworth.

Corydalis paniculata, 3700 feet, is a misprint for 7300.

Jasminum dichotomum. Don. Bhyms Khet, near Hawulbagh, probably *J. angustifolium*, Roxb.

Enanthe stolonifera, (on the Suwal.)

Ptychotis anethifolia. "Dhunjurree."

Hedera parasitica. Binsur, at 7400 feet:—on *Rhododendron*.

Hedera terebinthacea. Kosilla.

Ænothera grandiflora, (not *longiflora*.)

Berberis nepalensis, "Chotura." In great abundance on Binsur* from 7000 to 8000 feet. The "Jumne Mundroo" of Kirkpatrick's Nepal.

Polygala Rothiana.

Juglans regia, "Ukhor," a few trees wild on Binsur at 7500.

Euphorbia angustifolia (*dracunculoides*, Roxb.) From the Bhabur forests to 6000 feet; about which point it is succeeded by *E. hirsuta*.

* A few plants, not met with elsewhere in the vicinity of Almorah, will be found referred to this mountain, a very fine one, close on 8000 feet elevation, about 12 miles from that station to the N. E. It separates the smaller affluents of the Kosilla from those of the Surjoo. There are several Binsurs and Binesurs in Gurhwal, all sacred to Mahadeva, probably as Bindh-eswur, "Lord of the Vindhya;" or Bindhaik-eswur, which is equivalent to Baal-peor.

Leptopus (*Phyllanthus*) *cordifolius*. (Cluytia of p. 426.)

Silene conoidea, abundant in the cornfields.

Melianthus major. A solitary plant of what seems to be this species has existed from time immemorial in the Government Tea Plantation, Hawulbagh, formerly the property of Sir Robert Colquhoun, from whom Dr. Wallich received a portion of his Kumaon specimens, and who has been accordingly commemorated by a genus of the Labiæ. In Dr. Royle's Illustrations, p. 154, we are told that the Doctor's plant collectors obtained a species of *Melianthus* on "the lofty mountains of Kumaon," and Dr. Lindley (*Vegetable Kingdom*) apparently alludes to this circumstance when he says that *Melianthus* is remarkable for being found both at the Cape of Good Hope and in Nepal without any intermediate station." (Dr. Royle, Illustrations, p. 25, mentions it as a plant not found in *Nepal*.) Now, a considerable number of these lofty mountains of Kumaon have been explored by Lieut. Strachey, Mr. Winterbottom, and myself, and we could scarcely have missed so conspicuous a shrub if it existed in any of the localities visited. So far therefore, as this negative evidence is of value, added to the probability of the Hawulbagh plant being one of the Cape species, introduced from Calcutta or Seharunpoor, the anomaly of geographical distribution is explained and removed. The Hawulbagh species has never flowered recently, and may be new, introduced from our lofty mountains; or it may be *M. major*, and quite unconnected with the specimens alluded to by Dr. Royle, but the presence with it of pear, apple, plum, and other fruit trees, and flowering shrubs, manifestly from some Botanic Garden in the plains, with the absence of all specification as to the site of Dr. Wallich's specimens, is suspicious; and "plant-collectors" are glad enough to load their Herbaria with garden specimens, and for the most part not enthusiastic at all in exploring "lofty mountains." About 3 years since *M. minor* was in flower in General Tapp's garden at Subathoo; and *Ulex Europæus* at Simlah; where his (native) gardener assured me the latter was from the interior. Both were undoubted exotics, introduced by the General. Dr. Wallich's collectors may have supposed the Hawulbagh *Melianthus*—if this be *M. major*, and supplied the specimens in question—to be indigenous; the question can only be set at rest by a comparison of these with authentic ones of the Cape plant. That the identical species should occur in both countries

is extremely unlikely; the Himalaya having otherwise only one representative of the order as defined by Dr. Lindley; viz., a species of *tribulus*, found and figured at Leeo in upper Koonawur, by Mr. Charles Horne, C. S.* It should be added however, that Mr. Wm. Griffith (Journal of Travels, pp. 264, 265) mentions a *Melianthus* at 9500 feet near Jaisa, in northern Bhotan.

Zizyphus jujuba.

Reseda odorata. Becomes perennial at Almorah as at Algiers.

Rubus tiliaceus. "Kutrola," "Kutrota:" (*R. cordifolius*, Don.)

Potentilla supina, at 7400, on Binsur, and at Hurdwar.

Potentilla Wallichiana; a third species is undetermined.

Indigofera polyphylla.

Flemingia nana? Roxburgh; a small shrub, 3 to 5 inches high. Almorah.

Flemingia procumbens, Roxburgh, is no doubt the plant formerly entered here as *Dolichos*, "Mooskela." It is so called (mouse-plantain) from the form of its tubers, which are occasionally dug up and eaten by the poor. The plant reaches nearly to the summit of Luriya Kanta, and to 8500 feet, or more, near Nagkunda. I have not seen the deciduous calyx bracteoles mentioned by Roxburgh, and one of the two ovules seems generally abortive.

Eriosema ———. This is *Crotolaria tuberosa* of Don, *Pyrrhotrichia tuberosa*, W. and A.

Urtica caudigera.

Ficus virgata, (not *rotundifolia*.) "Beroo," "Bedoo." It is arborescent with ashy white bark and edible fruit, the size of a large gooseberry; and so far does not tally with Roxburgh's description.

Aerua scandens (not *lanata*.)

Polygonum Posumbu (Don.) near *P. barbatum*.

Stephania Wightii. Clypea of p. 431.

Campanula canescens (not *ramulosa*.)

* In Mr. Horne's numerous and interesting drawings may also be recognised three other plants new to Himalayan Botany:—

1. A *Symphytum*, at Bhyroo Ghattee on the Bhagiruthee.
2. *Calystegia sepium*, at Reeba in upper Koonawur.
3. *Tamus* (like *Cretica*) at Rukchum on the upper Buspa.

- Campanula agrestis*. Wallich, Kosilla and Suwal at 4000.
Oreoseris gossypina (not *lanuginosa*.)
Spermacoce lasiocarpa (not *stricta*: but very like it.)
Cyathocline lyrata: *Tanacetum purpureum*. Don's Prod.
Inula vestita, rare and dwarfed.
Blumea interrupta; N. S., extremely fragrant.
Erigeron Roylei (not *Aster bellidifolia*.) "Murch-mool."
Amphirapis pubescens (*Solidago Nepalensis*, Don.)
Bidens Wallichiana. The species so named here, may possibly be new: *B. gigantea*, as it is from 6 to 8 feet high near Bagesur; occurs from the base of the mountains to 7500.
Tricholepis elongata: (not *reticulata*.)
Thesium Himalense, (Royle,) common at 6500 feet on Binsur.
Ixeris hastata. Binsur, 7500. Common at Lohba House, Gurhwal, 5500.
Galium ciliatum, Don. Binsur, 7300.
Dipsacus inermis.
Mæsa argentea. "Phoosera." 5500. Western glens of Binsur.
 Fruit edible.
Cynoglossum prostratum, Don.
Orthosiphon virgatus. Common on the Kosilla.
Leucas hyssopifolia, (not *Indica*.)
Zapania nodiflora, to 4500.
Premna herbacea, (not *barbata*.)
Linaria ramossima, (not *incana*.)
Wulfenia Amherstiana. Common on Binsur at 7000 to 7500.
Scrophularia obtusa, N. S. near *auriculata*, p. 435.
Leptorhabdos (*Sopubia*) *parviflora*. Binsur, 6500.
Sopubia scabra v. *trifida*, (not *Gerardia delphinifolia*.) Common on warm grassy slopes at 6000—6500, from Simlah to Almorah.
Pergularia pallida. Kosilla, at 4000.
Crinum toxicarium. "Chundur-Kouwul" of p. 437.
Phœnix humilis? on very warm aspects this, in a very dwarfed state, reaches 7000 feet on Binsur. The fruit ripens at Almorah in July, and is then of a black, purple color. What little pulp there is, is sweet and the dates are eaten by the poor. In their color, that of the spadix, and minor points, the fructification bears a

very close resemblance to *Phœnix Sylvestris*, as described by Dr. Griffith, (Calcutta Journal of Nat. Hist. No. 19,) who was evidently inclined to consider this last, *Ph. acaulis*, and *Ph. dactylifera* but as gradations of one form.—Such a view seems very probable from the apparent impossibility of finding good characters to define these so called species.

Uropetalum. So Mr. Edgeworth thinks the blank may be filled up, line 7, p. 438.

Juncus dichotomus (not *bufonius*.)

**Commelyna salicifolia*.

Remusatia capillifera (not *vivipara*.) See ante.

Pothos decursiva? “*Kelounia*.” A very handsome species, at about 4000 feet, east face of Binsur.

Andropogon Calamus-aromaticus (or *Martini*.) This plant is called *Rhoonsee* in central India, and it is curious that at Syree (below Simlah) where it is abundant, the name is “*Reoonsh*,” and “*Dig-reoonsh*.”

Anthisteria arundinacea to 4000 on the Suwal.

Manisurus granulatus.

Leptothrium Roylei.

Pogonatherum polystachyum.

Spodiopogon laniger.

Brachypodium Nepalense.

Fimbristylis communis.

Mariscus cyperinus.

Trichelostylis junciformis.

Kyllingia multiceps.

Cyperus Iria.

Cyperus tegetum. (*Papyrus pangorei*?) is the plant entered as “*Motha*,” p. 440. It occurs wild, but is also cultivated on the bor-

* In the original paper, *Murdannia scapiflora* is inserted here, I suspect erroneously. The plant intended scarcely descends below 5000 feet, flowers in August with leafy scape, and is probably *Ancilema longifolia*. It is common along the Gagar range, up to 7000 feet, and is also found at Simlah and Mussoree. *Murdannia scapiflora*, on the other hand, flowers in May with a leafless scape, and does not, to my knowledge, ascend above 4000 feet, as at the Sat Tal, near Bheem Tal. The flowers are very like, and Dr. Royle (Illustrations, p. 403,) appears to consider the plants identical.

ders of inundated fields for the sake of the very durable mats made of its culms.

Botrychium lanuginosum.

Sinapis, pp. 441, 442. Vide corrections ante, p. 619.

Amaranthus farinaceus, (not *anardana*.)

Amaranthus caudatus (not *speciosus*.)

Cucurbita citrullus, "Turbooz." Not common.

Dolichos sinensis, "Lohbia." Gardens. During powerful sunshine, the leaflets of *D. catjang* may be observed in motion much like that of *Desmodium gyrans*.

Soja hispida, "Bhut." This pulse, though reckoned unwholesome, and only consumed by the poorest classes, is extensively grown in Kumaon, and is evidently of old standing, as many leguminous shrubs; *Desmodium*, &c., take their names "Bhutola," from it, as others, "Guhutya," from *Dolichos uniflorus*. The cultivation of *Soja* extends, I am assured, to Nepal and the north of Tirhoot, under the name of "Bhutnas" or "Bhutwas;" a circumstance not noted in our books on their agriculture.

P. 448, *Acacia dumosa*. This shrub, or small tree, not observed elsewhere in Kumaon, is common in Gurhwal up to the Ganges, and appears to be confined to the banks of the streams and rivers where they enter the plains and Doons. It is generally known by the same names, Keekur and Bubool, as *A. arabica*. The pinnæ are 3—5, the leaflets 4—10; glands various, and in its young branches, petioles, thorns, very villous with rufous down. It disagrees with the account in W. and A.'s Prodrusus. The flowers are white, probably in December or January; it is in young fruit in February. The peduncles solitary or in pairs, equal to, or twice as long as the leaves, with umbel of 3—7 legumes; 5—8 seeded, flat, smooth, linear, nearly straight, pendulous, 3—5 inches long, by less than a quarter of an inch broad; the border with a long shallow sinus between each seed. This form seems the main difference from *A. latronum*.

Burmdeo and Poonagiri, p. 571.

Wendlandia puberula.

Bambusa stricta, Roxb. is the common species of the Turæe and lower mountains.

Briedelia scandens, reaches the Suniya jungles.

Chhirrapanee, p. 578.

Eria convallarioides (*Octomeria spicata*, Don.) "Guroor-punja," it abounds in Kumaon on *Quercus incana* up to 7500 feet.

Androsace sarmentosa, not *lanuginosa*, is the plant which occurs here, and in all equivalent localities. *A. lanuginosa* is found at great heights along the snowy range from Busehur to Kumaon. Each plant is sarmentose and woolly, and Don has confounded them.

Ramesur, p. 586.

Saurawja nepalensis: bis, p. 589. *Sauravia* is a misprint.

Cantharospermum, a great climber, with yellow flowers in February, March, occurs here and in the forests of the Bhabur to Hurdwar.

Gungolee Bridge, p. 587.

Wendlandia exserta, var.

Pittosporum floribundum.

Lysionotus serratus (or *ternifolius*), a common shrub on the Surjoo nearly up to Kupkot.

Evonymus virgatus, N. S.

Ceanothus micropetalus, N. S.

Ocotea lanceolaria.

Tetranthera Roxburghii. "Gur-beejour;" from some resemblance of its leaves to those of the citron.

Urtica frutescens (not *Boehmeria tenacissima*.)

Blumea laciniata, vel N. S. *procera*.

Rhabdia sericea (Edgeworth.) This shrub, which is procumbent, with stems as thick as one's wrist, and 5 to 6 feet long, abounds in the bed of the Surjoo from this spot to the junction of the Reethagar stream, abreast of Binsur, and probably considerably farther in each direction. Mr. Edgeworth, about the same time, discovered another species in the Cane river near Banda, the genus being previously unknown in India.

Acacia Smithiana.

Hymenodictyon flaccidum.

Indigofera trita.

Desmodium reniforme.

Geniosporum strobiliferum.

} By Lieutenant Strachey.

The "Roogee" mentioned at p. 588, is not an *Actæa*, but belongs to an order intermediate between *Crucifere* and *Papaveraceæ*; and to a

genus which Mr. Edgeworth proposes to name "Stracheya," after Messrs. John and Richard Strachey, who first discovered the plant near the sources of the Pindur. It is not uncommon at similar altitudes (12000 feet) on the Gauree to the eastward; and Mr. Winterbottom found it, or a very similar species, on the lofty passes between Kashmir and little Tibet. Raised from seed or imported mature from the Himalaya, it speedily perishes at Almorah.

P. 590. *Rhynchosia pseudo-cajan*. "Shialee," "Phoosur-puta."

P. 595. *Chamærops*. The actual stature of this Palm on Thakil mountain is here considerably underrated. In December 1848, Mr. Winterbottom, without searching out the loftiest trees, measured one, the bole of which was 46 feet, 4 inches, with a crown of perhaps $3\frac{1}{2}$ feet more; another stem was $36\frac{1}{2}$ feet, and no doubt some attain 50. Mr. W. was fortunate enough to visit the spot when these Palms were covered with snow. Dr. Hoffmeister mentions this *Chamærops* on Dhunpoor in Gurhwal.

P. 607. The bitter *Olea* mentioned here is probably *O. compacta*; it is common by brooks in the warmer vallies of Kumaon and Kyoonthul, (Simlah.)

Clematis montana. This species is abundant in Kumaon and Gurhwal at 6500 to 7000 feet, where it apparently disappears, but only to be replaced by what may be considered a variety, becoming however, more and more luxuriant till, at 8000 feet, Fagoo woods, and 10,000 feet elevation on Doodootolee mountain in Gurhwal, and others in Kumaon, it attains its maximum, climbing 20 to 30 feet up *Abies Webbiana*, which it covers with sheets of large blossoms, of the purest white, with the fragrance of Meadow-sweet; variety or species, it is the handsomest of the genus.

Near Somesur, p. 610.

Mimulus gracilis. By water-courses.

Boora-Pinnath, p. 614.

Evonymus echinatus, is the blank species; *E. japonicus* is now considered to be distinct, and is named by Dr. Wallich *pendulus*; a tree of 40 feet, with yellow bark like *E. tingens*.

Vincetoxicum Kunawarensis, 9000 feet.

Orobanchium aurantiacum (not *luteum*.)

Pyrus vestita. This is the tree which, at Diwalee, (J. A. S. March

1847, p. 246,) under the name of "Moules" is named *P. crenata*: and Loudon (*Arboretum* II. 912,) is inclined to identify *crenata* of Don, with *vestita* of Wallich. The same name is applied to this species N. W. to Buschur, by the population immediately next the Himalaya, who, in all this tract, appear in many cases to have preserved the same, or but slightly modified names for the same plants; from which may be inferred identity of race. In the lower provinces of the mountains, on the other hand, the case is very different; more open to invasion, though scarcely more worthy of it, the population has been more mixed, and the dialects so altered that very few of the vernacular terms for plants proper to Simlah are in use at Almorah.

P. 618. *Symplocos paniculata* (not *racemosa*, which does not appear to ascend the mountains.)

P. 625. *Ligustrum bracteolatum*, is a common shrub in the Sutrale valley, at 4500 feet, and follows the course of the streams up to 7500, on Binsur.

The subjoined errata of the press require correction:—

P. 350	L.	9	for	400	read	4000.
"	"	"	23	insert	comma after	<i>Gagur</i> , period after <i>Chilbia</i> .
"	"	"	27	"	space	" span.
" 360	"	6	for	fullest	read	falsest.
" 367	"	35	"	pointed	"	painted.
" 376	"	7	"	Tiarea	"	Jiarea.
" 411	"	31	"	barbatella	"	barbellata.
" 418	"	14	"	forms	"	ferns.
" 423	"	31	"	3700	"	7300.
" 434	"	24	"	Feewace.	"	Heewace.
" 437	"	10	"	2500	"	1500.
" 440	"	23	"	Tsolepis	"	Isolepis.
" 571	"	18.21	"	following	"	foaming.
" 572	"	16	"	deserted	"	desecrated.
" 577	"	last	"	Bunlouree	"	Bumouree.
" 599	"	27	"	and	"	or.
" 600	"	12	"	from	"	form.
" 602	"	1	"	crossing	"	cropping.
" 607	"	31	"	that	"	That (<i>a village</i> .)
" 616	"	10	"	stories	"	stones.
" 618	"	21	"	Doonagiri	"	Poonagiri.

Identification of the plants found by Major General Hardwick between Hurdwar, Kotdwara and Sreenugur, in the year 1796, as detailed in the sixth volume of the Asiatic Researches :—

MONANDRIA MONOGYNIA.

Costus speciosus.

Curcuma (angustifolia.)

Diandria monogynia.

Jasminum 1, (dichotomum of Don, angustifolium, Roxb.)

Jasminum 2, (arborescens.)

Jasminum 3, (chrysanthemum, Roxburgh, and revolutum, Don : very probably also J. inodorum of Jacquemont ; J. Jacquemontii, De-caisne, and J. chrysanthemoides of Royle.) Hemapooshpika, Sanscrit, Sona-jahee, or Golden Jessamine of the Vernacular. It occurs from 5500 to 10,000 feet above the sea, and varies considerably in the size of the leaves, the position of the stamens, &c. The former, as well as the corolla, are ciliate.

It may be necessary to mention that the Udwanee mountain, where the General found this and so many more of his plants, is the highest range between Kotdwara and Sreenugur, being about 12 miles S. S. W. of the latter (direct distance) and 7151 feet above the sea, at Ranee-gurh, the Trigonometrical station.

Justicia (Phlogacanthus) thyrsoiflorus.

Salvia integrifolia (lanata.)

TRIANDRIA MONOGYNIA.

Valeriana (Hardwickii.)

TETRANDRIA MONOGYNIA.

Ixora tomentosa.

PENTANDRIA MONOGYNIA.

Androsace rotundifolia. (No doubt the General intends the perennial pink species flowering all the year : not Dr. Wallich's white flowering annual, *A. incisa*, which alone descends to the Turæe, flowering only in the cold season and spring. Don (Prodromus) confounds the two, and I believe that in Europe, the specific names are erroneously reversed.)

Lonicera quinquelocularis, (diversifolia of Wallich,) which never climbs. no other species grows near Udwanee, and this, except in wanting the 5-celled ovary, perfectly agrees with the combined character by Rox-

burgh and Hardwick : the General was inclined to identify his plant with Dr. Wallich's *L. ligustrina*, but may have intended the next species, *L. diversifolia*, procured from Gurhwal. The 5-celled berries would, taken alone, indicate *Leycesteria formosa*, but there the resemblance ceases ; and Dr. Wallich would at once have recognised that shrub in the General's drawing ; nor could I discover it anywhere in the Udwanee vallies, where *L. diversifolia* is abundant. The general may easily have mistaken the number of cells in a very immature berry, which, in that stage, much resembles a capsule, and has certainly at least 3 cells occasionally. Dr. Wallich's name being rather inappropriate, the shrub might be well called *Lonicera Hardwickii*.

Verbascum Thapsus.

Datura stramonium (alba.)

Ehretia tinifolia (serrata.)

Ventilago (maderaspatana.)

Celastrus scandens (nutans.)

Celastrus 2, (not identified : *C. montanus* or a species very like it, is common at such elevations, 4500 ft., all along the mountains.

Cedrela (Tuna.)

Doubtful genus coming near *Hirtella*, (probably *Embelia picta* : compare *Celastrus rufus*, Wallich.)

Vitis (lanata.)

Gardenia (*Randia*) *uliginosa*.

Gardenia 2, (*Randia longispina*.)

Gardenia 3, (*Randia tetrasperma* : *G. densa*, Wall.) Both descriptions are of shrubs eaten down by goats : when uninjured, *R. tetrasperma* assumes a very different appearance, by no means dense, and 10—12 feet high. The flowers are *terminal*. It is probably *Gardenia rigida* of Don's *Prodromus*.

Nerium (*Cryptolepis*), *reticulata*.

Nerium 2, (*Wrightia mollissima*.)

Echites antidysenterica, (*Holarrhena pubescens*.)

Genus not determined, (*Evonymus tingens*.)

PENTANDRIA DIGYNIA.

Apocynum, (*Vallis dichotoma*.)

Asclepias. Doubtful. (*Hoya viridiflora*.)

Herniaria. Doubtful. (*Deeringia celosioides*.)

Gentiana nana, (marginata.)

PENTANDRIA TRIGYNIA.

Gouania nepalensis, Wallich. The General's description is imperfect, and even erroneous, but from its abundance, there can be little doubt this is the shrub intended.

PENTANDRIA PENTAGYNIA.

Linum trigynum: shrubby, grows to be a spreading bush, about 4 feet high. Stem and branches erect. (This shrub is common everywhere from the base of the mountains to above 7500 feet, where it disappears. Except in the pale sulphur-yellow, and delicate fragrance of the flowers, it differs in no way from the shrub of our Indian gardens. Wight and Arnott suppose the Bengal and Nepal plant to be *L. repens* of Don, and so it is no doubt, the latter species being constituted solely from its appearance on the banks and terrace walls, where it is annually (with other shrubs) clipped down by the cultivators, as well as constantly nibbled by the cattle; the natural position is erect, and the height is sometimes 6 to 7 feet. Dr. Royle is inclined to consider *L. cicanoba* as a probable variety of *L. trigynum*, and Mr. Bentham to identify the last with *repens*: we have then only left, *L. tetragynum*, which is assuredly a mere accident; 5 or more styles being occasionally met with, either free or in various stages of cohesion up to the "semi-trigynum" of Hamilton.

HEXANDRIA MONOGYNIA.

Berberis ilicifolia, (identified by Roxburgh with his *B. asiatica*. From the Kali to the Bhagiruthi there is certainly no species which can be mistaken for it; and unless an abrupt change occurs at Mussooree, it is *B. lycium* of Royle. The latter however is well known there by the name "Kingora," which is also the designation of *B. asiatica* S. E. to the Nyar, where, as in Kumaon, Kilmora becomes the term used. *B. aristata* occur on Udwanee, but the General does not appear to have discriminated it.)

HEXANDRIA TRIGYNIA.

Rumex Ægyptius (Wallichianus), and *acetosella* (*hastatus*. The last occurs from the foot of the mountains to 8500 feet, and perhaps higher.)

OCTANDRIA MONOGYNIA.

Polygonum convolvulus (*pterocarpum*.)

ENNEANDRIA MONOGYNIA.

Laurus cassia (cinnamomum albiflorum.)

DECANDRIA MONOGYNIA.

Bauhinia scandens (Vahl.)

Bauhinia variegata.

Guilandina moringa, (*Moringa pterygosperma*.)

Murraya exotica.

Melia azadirachta (probably the Bukayun, not the Neem, is intended, the last is rare in the forests; indeed I did not observe it at Kotdwara, where the Bukayun is common, though perhaps not wild. Notwithstanding all that Dr. Royle has written on the subject, it seems quite unnecessary to make the "Bukayun" a new species of *Melia*; it agrees perfectly with the *Melia azedarach* of Roxburgh, Wight and Arnott, and Loudon's *Encyclopædia*, where the description of the drupes tallies with Dr. R.'s account (p. 141, Illustrations) of the Bukayun; and certainly the tree of Provence, Egypt, &c., is no other;—nor do the people of northern India generally (and apparently of Nepal) know of any other. Munshí Murdan Alí, of Seharunpoor, informs me that the "Dek" is a mere variety, only differing from the Bukayun by a more spreading habit, which gives less shade; and, one of the Seharunpoor gardeners now employed at Hawulbagh, on being asked what was the "Dek," pointed at once to the Bukayun, which I have heard termed "Dykna" in Gurhwal, and "Jek" near Simla. The size, as well as the form and number of the leaflets on each pinna of the Bukayun differ so considerably even on the same branch, as to remove any reliance on this kind of test; and yet it so happens that Messrs. Weight and Arnott found Roxburgh's own specimens of *M. azedarach* and *sempervirens* so much alike as to appear as if cut from the same tree. "Dr. Roxburgh also states the *Bukayun* to be a native of Persia, though common throughout India, and that its Arabic name is *Ban*. This, in addition to the specimens in the East India Herbarium, perfectly identifies his plant with that of northern India." (Royle.) But the plant so named by Roxburgh is his *Melia sempervirens*, "a small, delicate, evergreen," which is certainly unknown in northern India, and, from the silence of W. and A. apparently equally so, in the south. Roxburgh found his plant to coincide with those raised from West Indian seed of *M. sempervirens*, which however, so far from being a small evergreen, is said in Loudon's *Encyclopædia*, to be a tree

of 40 feet, considered by some only a variety of the *azedarach*." Assuredly no tree is less entitled to the epithet of "*sempervirens*" than the *Bukayun*, which for 3 or 4 months annually, is the most marked of the deciduous trees of northern India. The same species may be evergreen in the damp and equable temperature of the West Indies; and, if we suppose Dr. Roxburgh to have made his descriptions from very young plants (which in many species are more or less evergreen,) his *M. sempervirens* may be accounted for. He states it to be "common throughout India," and to blossom more or less throughout the year, which is another difficulty, the *Bukayun* being very periodical, and flowering at Almorah, for example, in April, May or a month later than at Meerut.

I cannot find that Dr. Roxburgh identifies his *Melia azedarach* with the "*Dek*," as distinguished by Dr. Royle from the "*Bukayun*," nor that he had ever heard of such a tree. However, as Dr. Royle has done so; and as the *Bukayun* also answers to the description of *M. azedarach*, the only conclusion is that they are one and the same, which is the common opinion in northern India. The *Bukayun* is a smaller tree than the *Neem*, and as *muha* denotes *best, excellent*, as well as *great, muha-neem* must apply to its blossoms and their odor, rather than to its dimensions, possibly also to the extreme bitterness of the bark, an infusion of which is used in the mountains to expel leeches.

The expression "*spreading tree*" used by General Hardwick for the *Melia* of Kotdwara is exceedingly opposite to the *Bukayun*, and is an exact translation of the Persian "*Azad-i-durukht*," as well as of its Sanscrit equivalent, "*Nibundh*." The vernacular terms "*Bakarjun*" of Bengal, and "*Bukayun*" of Hindoostan, are to be traced in the Sanscrit roots *vuk, vukr*, bent, crooked (*bonghs*,) and afford some proof that the tree is indigenous to India, but in Kumaon at least it never occurs to my knowledge but in spots near which it is likely to have been planted. The people, however, have their own name for it—"Betain." The fruit remains on the tree a full year, untouched by beast or bird excepting the *Bulbuls*, (*Ixos jocosus*,) who may be observed devouring it with avidity, and thus perhaps it has been scattered so far as to induce in some a belief that it is indigenous, as indeed it may be.)

Doubtful, (*Garuga pinnata*.)

Doubtful, (*Rhododendron puniceum*, Roxb. *arboresum*, auct.)

Arbutus, doubtful. (*Andromeda ovalifolia*, *Arbutus herpetica*, Roxb.)

DECANDRIA TRIGYNIA.

Banisteria Bengalensis. (*Hiptage madablota*.)

DECANDRIA PENTAGYNIA.

Spondias myrobalanus (*mangifera*.)

Sedum album (*adenotrichum*.)

Oxalis acetosella. On the heights of Chichooa, on a small spot of pasture. (Dr. Griffith found it near Tongsa in Bhotan; *Journals of Travels*, p. 268. Lieut. R. Strachey at Diwalee and other spots in northern Kumaon; and I have lately seen it in abundance at Ludoolee Ghat, at 7000 feet elevation, on the S. W. face of Doodootolee mountain, 6 or 7 miles from the source of the Nyar river. It flowers in March and April, and is undistinguishable from the English wood-sorrel.)

Cerastium alpinum, (*triviale*.)

Doubtful, (*Dentzia staminea*, very like *D. scabra*.)

DODECANDRIA MONOGYNIA.

Cratæva tapia. (*Ægle marmelos* or *Cratæva nurvala*. Both occur, the first very common. *Grislea tomentosa*.)

DODECANDRIA TRIGYNIA.

Euphorbia canariensis (*pentagona*.)

ICOSANDRIA MONOGYNIA.

Punica granatum.

Prunus. (*Cerasus Pudum*, *Prunus sylvatica*, Roxb.)

ICOSANDRIA DIGYNIA.

Cratægus. (*Cotoneaster microphylla*, Roxburgh's *cratægus integrifolia*.)

ICOSANDRIA PENTAGYNIA.

Pyrus (*variolosa*.)

Spiræa (*chamædrifolia*.)

ICOSANDRIA POLYGYNIA.

Rosa (*Brunonis*.)

Rubus (*Gouree-phul*, Roxb., *rotundifolius*, Wall., *flavus*, Don. The name *Gouree-phul*, signifying claret-purple fruit, is only used in Gurhwal by the pilgrims from the plains to Budreenath, &c. The mountain name is "Heesura" or "Heesur" in Gurhwal, and, more correctly "Heesaloo" in Kumaon and Ayshala in Nepal, according to Don, *Escaloo*, of

Aikin, from the Sanscrit *hinsaloo*, hurtful, mischievous. So, in northern India another thorny shrub, *Capparis sepriaria*, is called *Hins*, and *Heenge*, from the same root, *his*, to hurt. *Hinsuna*, *Abrus precatorius*, (Wilson) is therefore, perhaps, more properly *Capparis sepriaria*. *Heesaloo* is *R. rotundifolia* especially, the black, orange, and other species are discriminated as *Kulia*, *Jogia-heesaloo*, &c.

Rubus idæus, (identified by Roxburgh with his own *roseiflorus*, *distans*, Don; *R. lasiocarpus*, Smith. If I am right in identifying it with *R. distans* of Don, it is the only species of Himalayan *Rubus* common to the plains and mountains, being found in the open country at Chilkya, and as high as 7500 feet. *R. goureephul*, descends to, but does not quit the base of the mountains.)

Fragearia sterilis (indica, W. and A. very near *F. Malayana*, Roxb. but the peduncles are usually leaf opposed. It grows up to 8000 feet.)

Potentilla fragarioides, (a species common in Gurhwal and Kumaon; not determined, but near *P. Leschenaultiana*.)

Potentilla reptans (Wallichiana.)

POLYANDRIA MONOGYNIA.

Lagerstroemia montana (reginæ.)

Doubtful. (*Symplocos cratægoides*, *paniculata*, Wall.)

POLYANDRIA POLYGYNIA.

Uvaria (tomentosa.)

DIDYNAMIA GYMNOSPERMIA.

Ballota (*Roylea elegans*.)

DIDYNAMIA ANGIOSPERMIA.

Bignonia chelonoides (suaveolens.)

Gmelina arborea.

Volkameria? *bicolor* (*Clerodendron odoratum*.)

Vitex trifolia, (negundo.)

MONADELPHIA MONOGYNIA.

Careya (arborea, v. *pomifera*.)

MONADELPHIA DECANDRIA.

Geranium (*bicolor*, *Royle*, and probably *ocellatum*, Decaisne.)

MONADELPHIA POLYANDRIA.

Bombax Ceiba (malabarica.)

Bombax (*Cochlospermum*) *gossypium*.

DIADELPHIA DECANDRIA.

Robinia 1 (*Pongamia glabra*.)

Robinia 2 (*macrophylla*.)

Robinia 3, doubtful. (*Pueraria tuberosa*. The Kumaon terms for this plant all refer to the cat, as Billee, Bilacee-kund, Biralee-poua:—"cat-root," "cat-cake," but *why*, is difficult to say. Its host of Sanscrit names have no reference to this animal.)

Pterocarpus (*Dalbergia sissoo*.)

POLYADELPHIA POLYANDRIA.

Hypericum (*ceruum*.)

SYNGENESIA POLYGAMIA ÆQUALIS.

Prenanthes (not recognised, but probably a species of *Conyza*.)

(*Leucomeris spectabilis*.)

Leontodon taraxacum (*eripus*.)

Hypochoeris glabra (*Ammoseris patens*?)

Hypochoeris radiata (*Tragopogon gracile*?)

SYNGENESIA MONOGAMIA.

Lobelia Kalmii. (*Pyramidalis*.)

Viola palustris. (*Patrinii*.)

Impatiens noli-tangere. (*Himiltoniana*?)

GYNANDRIA DIANDRIA.

Limodorum (*Apaturia Smithiana*?)

Epidendrum 1, (*Saccolabium guttatum*, or *papillosum*, or both.)

Epidendrum 2, (unknown.)

GYNANDRIA DECANDRIA.

Helicteres isora.

GYNANDRIA POLYANDRIA.

Grewia 1, (*sclerophylla*.)

Grewia 2, (*elastica*.)

Pothos officinalis.)

MONÆCIA TRIANDRIA.

Phyllanthus grandifolia (*Emblica officinalis*.)

MONÆCIA TETRANDRIA.

Betula, (*Alnus nepalensis*; according to General H. the leaves are "ovate, obtuse;" Roxburgh says "some obtuse, some pointed." Certainly the same species is found from the Sutluj to the Kalee, *A. obtusifolia* of Royle: but probably *A. nepalensis* of previous writers. "The bark is an article of trade into the plains of Hindoostan, said to

be used by the manufacturers of Chintz to dye red, known by the name of *Ateess*." Hardwick, who so far justifies Dr. Wilson under Utivisha. But the Gurhwal term is "Ootees."

Cicca disticha. *Averrhoa acida*, Linnæus. *Phyllanthus (longifolia)* Roxburgh. (The General writes as if it were wild, but I never met it in the mountains wild or cultivated.)

Morus 1, (*serrata*, Roxb. *pabularia*, Decaisne. It is diœcious.)

Morus 2, (*indica*.)

Morus 3, (*serrata* : but mentioned as if monœcious.)

MONÆCIA POLYANDRIA.

Quercus (incana).

Juglans regia.

Carpinus, doubtful. (*Engelhardtia Colebrookiana*.)

MONÆCIA MONADELPHIA.

Pinus Tæda (longifolia).

DIÆCIA DIANDRIA.

Salix (tetrasperma).

DIÆCIA PENTANDRIA.

Xanthoxylon (alatum). This is probably the "Iwurantika" or *Fever-dispeller*, of the Indian *Materia medica*, explained by Wilson as a kind of *Neem* from Nepal ; which is a tolerable botanical definition as lexicons go. It is still known as "Jubrung" in Assam ; Griffith. "Tejbul," the designation in the N. W. Himalaya, is from the S. Tejovutee, "a plant bearing a fruit resembling pepper," from *tejus*, pungency. The capsules are considered very cooling.

Cannabis sativa.

DIÆCIA DODECANDRIA.

(*Tetranthera monopetala*. Roxburgh.)

POLYGAMIA MONÆCIA.

Terminalia alata-glabra (tomentosa).

Mimosa (Acacia) catechu.

Mimosa 2, near Lebbeck. (*Acacia*, now *Albizzia stipulata*, rather common at the base of the Kumaon and Gurhwal mountains, as well as in the warm vallies.)

POLYGAMIA TRIÆCIA.

Ficus laminosa, (common on the rocks by the river banks, at from

1500 to 2500 feet above the sea, from Burmdeo to Tupoobun on the Ganges.)

Ficus 2. (*Luducca* of Roxburgh; common about Almorah as "Kabra.")

Ficus 3. (*Chincha*, Roxburgh, also common as a shrub in Kumaon, in the low vallies, and in the forests at the foot of the mountains, it becomes a small spreading tree, probably the *F. squamosa* of Roxburgh.)

Ficus 4. (*Macrophylla*.)

Kaipul. (*Myrica sapida*. From some external resemblance in fruit, the strawberry has its mountain name of "Kuphulia.")

Place unknown, Linnæan system.

Sterculia villosa. The "Ooddal" of Kumaon, (Gooddala of Gurhwal,) and known by the same name down to Assam; the inner layers of the bark making excellent rope. (Griffith, in J. A. S. April 1839.) We have also in the Catalogue of woods, J. A. S. for April 1833, *Odda* given as the Gwalpara name of *Sterculia urens*, the bark of which is there said to afford a coarse rope used in catching wild elephants. Most probably alluding to the "Oodal" of Assam, *Sterculia villosa*, vide Journal of Agri. and Hort. Soc. of Bengal, Vol. VI. 139. The word is Sanscrit, and is explained by Wilson, *Cordia myxa* or *latifolia*; but the etymology from *Ood*, large, and *dul*, to split, tear, divide, must strike every one who sees the process as a strong presumption in favor of the existing usage of the term. In Khurwa-oodal, Kumaon, Khurdala, Gurhwal, we have a modification of the term to express Dr. Royle's yellow variety of *Sterculia coccinea*.
